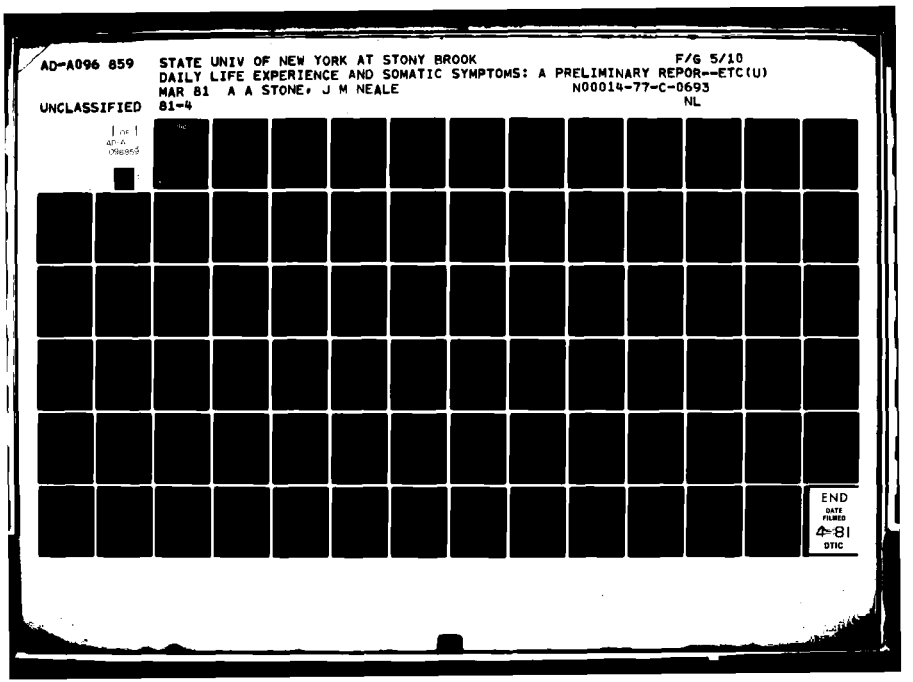
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Daily Life Experience and Somatic Symptoms: A Preliminary Report

Arthur A. Stone

Long Island Research Institute

and

Department of Psychiatry and Behavioral Science
State University of New York at Stony Brook

and

John M. Neale

Department of Psychology
State University of New York at Stony Brook

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This report presents a description and preliminary analyses of a prospective investigation of daily life experiences, mood and somatic symptomatology. Using a questionnaire (The Assessment of Daily Experience) and joint husband-wife recording methodology, fifty couples each completed approximately 85 days of forms. Husbands were the targets of the investigation and wives served as observers of their spouses. A total of about 24,000 experiences were recorded. An analysis of events' appraisals on four psychological

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dimensions is presented. Schemes for condensing symptomatology and event information were developed, and the event scheme was shown to adequately predict concurrent mood. Preliminary analyses consisting of relative risk and parametric tests of event classifications predicting later (within five days) symptoms was performed. Although not entirely clear, tentatively it appears that desirable and stabilizing experiences protect individuals from subsequent symptoms.

Daily Life Experience and Somatic Symptoms: A Preliminary Report

Explorations of the association between environmental events and illness mushroomed following the development of Holmes and Rahe's (1967) method of quantifying life stress. They compiled a list of 43 events, the Social Readjustment Rating Scale (SRRS), which subjects rated using Steven's (1974) magnitude estimation technique. Each event was rated according to the amount of "social readjustment" necessary to accommodate to it compared with the amount of readjustment inherent in getting married (the scaling modulus). The readjustment coefficients were then used to weight scores on the Schedule of Recent Events (SRE), a paper and pencil measure parallel in form to the SRRS used to determine which of the 43 events a subject had experienced. The sum of the SRE, called the Life Change Unit (LCU), was used to predict various measures of psychiatric functioning and physical illness.

Psychiatric, psychological, and sociological journals are currently replete with studies using the SRRS/SRE method and the conditions studied range from myocardial infarction to severe depression. Although its success as measured by popularity may be impressive, criticism of the substance and methods of the SRRS/SRE has been plentiful (for example, Andrews & Tennant, 1978; Brown & Harris, 1978; Cline & Chosy, 1972; Dohrenwend & Dohrenwend, 1974; Wershow & Reinhart, 1974). Among the many problems are the nonrepresentativeness of events on the SRE, the overlap between events and symptoms, the reliance on social readjustment as the sole rating dimension, and the stability of SRE data.

Even more importantly, however, the associative relationships found in life events research are difficult to interpret causally (e.g., Brown, 1974). Most of the studies have used either purely retrospective designs or partially prospective designs (in which illness is prospectively assessed but life events are rated for the period prior to the date collection). The retrospective nature of these designs clearly opens the door to the possibility of serious contamination of the data. Although truly experimental studies are almost impossible to conduct in the natural environment, non-experimental prospective research has the potential to untangle the temporal sequence of events and illness.

In order to conduct prospective research concerning the relationship between life events and health an assessment of daily life events was needed. We have previously developed such an instrument, the Assessment of Daily Experience, ADE (Stone & Neale, in press). We chose days as a unit of analysis because we felt that a thorough characterization of a 24 hour period was possible without major retrospective-recall bias. With days as the unit of analysis, the specific life events to be rated must include more mundane happenings than are found in previous life event inventories. But over time the major events which have been retrospectively reported on other

inventories can be still recorded, probably with greater reliability. Furthermore, there is theoretical and clinical support for the idea that minor daily events are related to illness. Lazarus has discussed the etiological significance of environmental stresses ranging from large scale catastrophes to more personal daily "hassles" (Lazarus & Cohen, 1977). Furthermore, Wolff has offered clinical support for the effects of "minor" events on somatic health (Wolff, Hare & Wolf, 1950) as have several Soviet researchers (see Kurstin, 1976).

In developing the ADE we first required a sample of daily activities and therefore had a group of participants record their daily experiences, in diary form, for two weeks. To make their task practical we limited their recording by having half report only events which were more meaningful than usual and the remainder record events which were emotionally laden. Close to two thousand experiences were reported and these were then organized into content categories.

The resulting checklist included five major headings and 16 subheadings: Work Related Activities (concerning your boss, supervisor, upper management, etc., concerning co-workers and/or employees, general happenings concerning self at work), Leisure (physical, social with friends, vacation, family outings, personal), Financial, Family and Friends (concerning spouse, concerning children, concerning relatives, concerning friends and neighbors, family duties) and Other happenings and activities (personal, other). Sixty-six individual items were distributed across the 16 subheadings. These items themselves were often brief, having been partially described by the two levels of headings, although examples were included in parentheses for some of them.

With the initial checklist in hand, we next laid out questionnaires with the items and their rating dimensions, and developed a protocol for completing the form. The dimensions on which daily experiences were rated were taken from a factor-analytic study reported by Redfield and Stone (1979). In that investigation, 94 rather major life events were rated by college students on six bipolar scales suggested by previous life event studies. The original scales were reduced to three factors labeled desirability, change, and meaningfulness.

In addition to events which have actually occurred, we allowed items to be checked and rated if they were anticipated as occurring in the near future. In accord with Lazarus's (1966) theory, this step was taken to allow the possible psychological impact of anticipations to be assessed. Items checked as anticipations should not be considered "events" as there is no objective stimulus; however, we included them because their psychological impact may be as great as that of real events (Lazarus, 1966).

Twentyseven couples then used the form for two weeks. One member of each couple was the target and recorded their own experience. The other person served as an observer and completed the ADE about the target. The form adequately allowed people to record their

experiences; the blank spaces, which had been included to allow people to record events not included in the ADE, yielded only 2% of the events reported. Some of the written-in events did, however, suggest that minor changes should be made in the content of the ADE. The ADE also performed as expected in several validity checks; for example, desirable experiences were related to positive mood scales on the Nowlis (1965) Mood Adjective Checklist which was also completed on a daily basis. Finally, the husband-wife concordance figure was calculated and found to be .31. Although this figure is rather low, it must be remembered that it does not reflect a traditional inter-observer reliability assessment. In using the ADE the observer has much less than complete information about the target's experience.

Another study was conducted to examine further the sources of husband-wife disagreement. Based on our experience in the first study, the ADE was modified somewhat and the theoretically interesting dimension of control over an event's occurrence was added to the rating dimensions. Couples in this study also received much more extensive training in using the ADE before embarking on their two weeks of recording. Half the couples were called, late in the evening, on randomly selected days during their recording period. During these calls the husband and wife were each on one extension telephone and the entire the ADE was reviewed with questions being asked about the source of any disagreements.

Of the events coded only be targets, 72% were those that the observer had not observed. Of the remainder, 13% were forgotten by the observer and another 13% were judged as too minor to record. Of the events recorded only by the observer 38% were judged by target as too minor to record and 23% had been forgotten. Thus, the data indicated that the majority of discordant responses were not "errors" but reflected the different amount of information available to target and observer.

Based on data from this study the ADE was again slightly modified. In addition, we decided to retain the target-observer recording format in subsequent studies. In the final procedure, the target and observer first work independently to complete the ADE. Next they get together to go over each others' forms and produce a master set of the day's events. This procedure forces the resolution of any discrepancies between the two forms. Finally, the couple separates again and completes the rating dimensions for the agreed-upon events.

Based on data we have collected, we believe that we have developed an instrument which can be used in the prospective, longitudinal study of the relationship between life events and illness. Important features of the ADE include the following: (a) The sample of events was based on an empirically generated pool which was then reduced to a manageable number of items. The low frequency of write-ins demonstrated that the categories were indeed adequate for the task of allowing participants to record their daily experiences, yet we retain the write-in option for the few times when events cannot be otherwise recorded. (b) The checklist method minimizes the effects of daily

fluctuations in mood and health which might seriously contaminate diary methods. (c) Subjective reactions to the events are rated on four dimensions (three of them empirically derived), rather than the unidimensional approaches of past efforts. To our knowledge, this is the only life event instrument which includes ratings of the perception of anticipated events. (d) The form takes only 10-15 minutes to complete, thus reducing the likelihood of substantial attrition in longitudinal studies. (e) Reliability of event reporting seems adequate. As revealed by the telephone call in the last study, a substantial proportion of discordance was due to observers not being aware of events reported by the targets. Our current procedure, having the forms completed by both target and observer, is designed to maximize the accuracy of the report of a day's events. Several possible sources of error are reduced by having the target and observer first fill out the ADE independently and then reconvene to go over each other's checklists. First, in instances of target-alone reports, the target is forced to corroborate the occurrence of those events which the observer was not able to witness. Second, in the case of observer-alone reports, the observer's checklist functions as stimulus for the target's recall. Third, the couple is forced to agree on the category in which to code an event, thus minimizing the use of inappropriate categories. Finally, the procedure brings the recordings of both target and observer under each other's scrutiny which may increase accuracy by minimizing haphazard reporting and simple errors.

With an adequate assessment device in hand we have now conducted a ninety-day prospective study. Forms were printed which combined the ADE, the Nowlis Mood Adjective Checklist, and an assessment of daily symptomatology. The data allow the first methodologically sound evaluation of the hypothesized link between life events and illness. In addition, the daily mood recordings allow us to examine the possible mediating and/or contextual influence of affective states on the events-illness relationship. Finally, a number of measures (personality, social supports) permit detailed comparisons between those people who are or are not reactive to life events.

This report is limited to an examination of life experiences and minor somatic symptoms. It includes a description of the frequencies of event and symptom reports, the methods by which the raw data was summarized, and a preliminary report of the relationship between experiences and symptoms.

METHOD

Subjects

Participants were recruited through advertisements placed in local newspapers and by direct mailings to communities proximate to the University. Because the advertisements and mailings overlapped it was not possible to determine exactly the response rate. It is clear, however, that this is a volunteer sample, although its demographic characteristics are similar to those of local census tracts.

The 79 subjects who responded to the mailing or advertisements were contacted by telephone to arrange an interview. Thirteen of these (16%) immediately dropped out after the interview; that is, no daily the ADE forms were completed. The completion rate of the remaining couples ranged from a low of 2 forms to more than 90. In order to be able to explore the hypothesized stress-illness relationships, some couples were eliminated as they did not complete enough forms. The cut-point for being included as a complete subject was 40 correctly completed forms; 16 families completed less than 40 forms and fell into the second kind of drop category, partial completers. There were, then, 50 couples who remained for the final analysis. For these 50 men the average number of correctly completed forms per subject was 85.94. Decisions on how to handle missing data as well as on other problems which arose with the data will be presented as they are needed.

Demographic characteristics of the three groups are presented in Table 1. Each variable, with the exception of the percent owning their own home, was analyzed with a one-way anova. Significant F -ratios were followed-up with Newman-Keuls contrasts between groups. There were only two instances (husband age and wife age) in which significant ($p < .05$) F - ratios were found. Therefore, demographic characteristics do not differentiate among those participants who completed, partially completed, or did not begin the study.

Procedure

During the interview which preceded the study participants were trained in using the ADE. The procedure was thoroughly explained, the couple coded the events of the last two days and their responses were then reviewed to locate any problems. At this time demographic data was collected and the couple also completed the following additional questionnaires:

1. Myers, Lindenthal and Pepper's (1974) life events list was used to assess the major life events which had been experienced in the past year. These events could moderate any results obtained in the prospective study.
2. Two instruments were used to assess symptomatology in the past year. One of them is the same instrument used in the prospective study; the other was taken from HEW's National Assessment of Health, The Health and Nutrition Examination Survey (1973). This measure asks respondents to check diseases or conditions which their physician has informed them that they have. Prior symptomatology was assessed because amount of prior illness is an important predictor of future illness.
3. Pilowsky's (1967) measure of hypochondriasis was obtained as a possible moderator of the accuracy of symptom reports.
4. Mechanic's (1972) Sick Role Tendency Scale was used as another measure of potential inaccuracy of symptom report.
5. Jackson's Personality Research Form (1974, Form E) yields 20

Table 1

Demographic Characteristics of Completers(N=50), Partial Completers(N=16) and Those Who Terminated After the Interview(N=13)

Variable	Completers		Partial Completers		Terminators	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Number of rooms in house	7.40	1.59	7.13	1.45	6.58	1.62
Number of households in residence	1.04	.20	1.88	2.09	1.50	1.73
Years in residence	9.90	6.74	7.69	6.20	9.33	6.98
Number of children	2.73	1.56	2.19	1.33	2.25	1.06
Number of years married	16.72	9.56	12.50	8.26	20.92	16.06
Husband age	41.35	10.24	35.94	7.07	45.50	15.76
Wife age	38.78	9.96	33.50	8.12	43.83	14.95
Husband Education (years)	14.71	2.92	14.56	3.29	13.08	2.50
Wife Education (years)	13.64	2.37	14.38	2.19	12.42	1.50
Status of husband's current job[a]	55.42	24.60	64.31	20.75	44.75	30.03
Income (thousands of dollars)	28.78	12.13	29.75	20.79	27.75	14.09
Percentage Homeowners	94		100		92	

[a] Based on the National Opinion Research Center scale.

bipolar scales and two validity scales. It was included because personality factors may interact with life events experienced in producing illness.

6. The Short Marital Adjustment Test (Locke and Wallace (1959) was completed because the accuracy of our research protocol probably requires at least an average level of marital harmony.
7. The Adaptive Potential for Pregnancy Scale (TAPPS; Nuckolls, Cassel and Kaplan, 1972) was included as a measure of psychosocial assets. Items dealing specifically with pregnancy, the context in which the scale was developed, were eliminated. Psychosocial assets and social supports may moderate the life events-illness relationship.

The goal of the study was to collect 90 consecutive days of daily reports using the ADE, the Nowlis Mood Adjective Checklist, and the Wyler, Masuda and Holmes (1967) Symptom Checklist. The latter instrument contains 93 symptoms, covering both major and minor conditions, which have been scaled for level of severity. These three instruments were printed on both sides of a page which could be inserted into a booklet containing instructions.

The procedure we used was based on our previous research and involved using husbands as targets and wives as observers. Each night the husband and wife completed the Nowlis Mood Adjective Checklist, the husband about himself and the wife about the husband. Symptom reports were then completed. Finally, spouses filled out the event portion of the ADE independently. They then reviewed each others' forms and arrived at a master set of the target's events and anticipated events. All events were then independently rated on the four dimensions. For the two bipolar dimensions (desirability-undesirability and changing-stabilizing) the ratings were completed using adjective-anchored 14-point scales. Meaningfulness and control were rated using adjective-anchored 7- and 5- point scales, respectively. The day's forms were mailed to us the next morning.

Subjects were paid $80. for participation. Payments were prorated for those who did not complete 90 days.

RESULTS

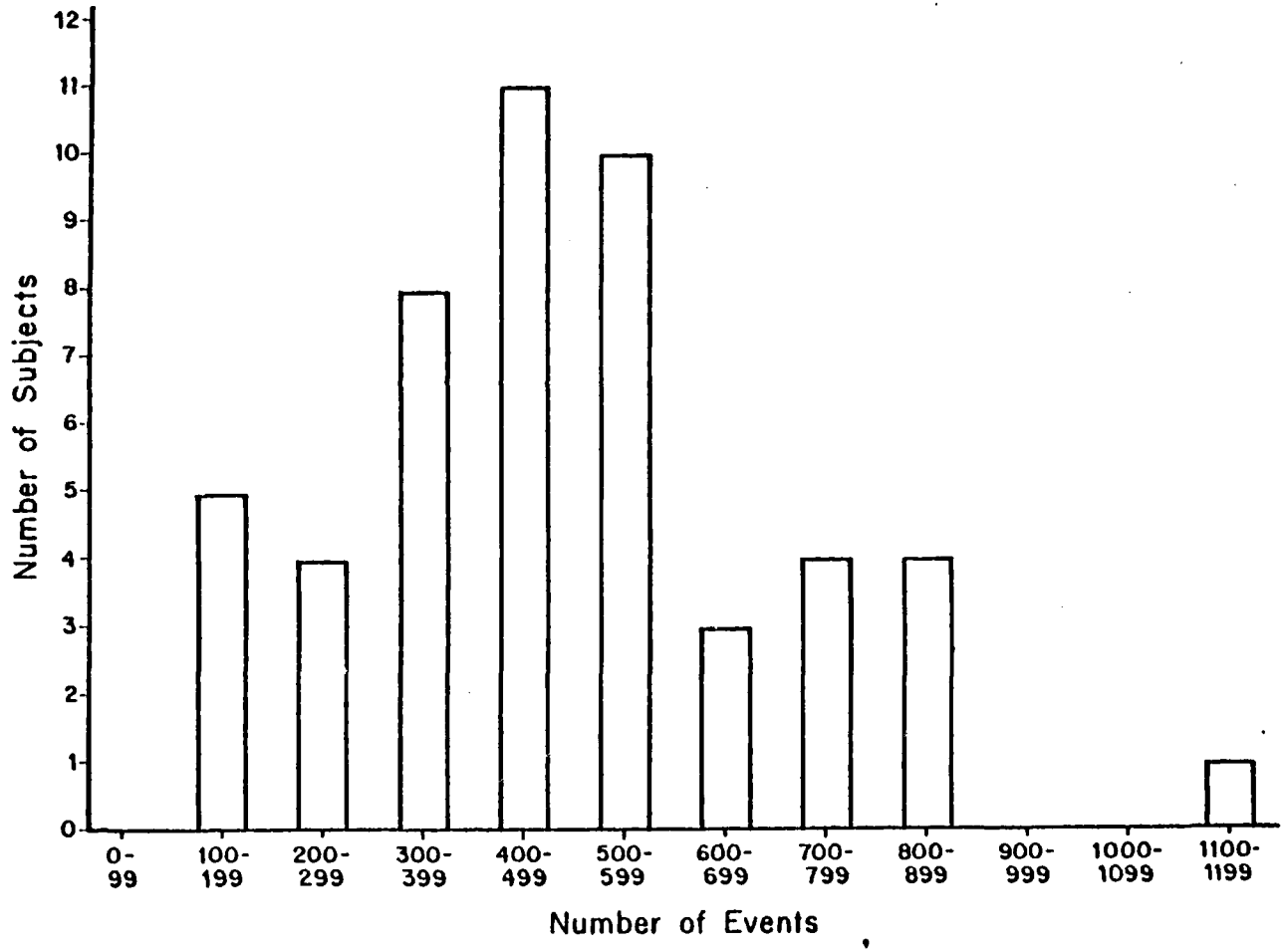
Event Reporting and Frequency

The 50 male respondents who we have labeled as complete subjects reported a total of 22,751 events and 1998 anticipated events on the ADE. An average of 5.26 events and .46 anticipated events were reported daily. The distribution of the number of events and anticipations reported during the study for each male respondent is found in Figure 1. The range is from 116 to 1,194. Examination of the histogram found in Figure 1 shows that the individual who reported the highest number of events during the 90-day reporting period stands out alone when compared with the reporting patterns of the remaining 49

Figure 1

Distribution of the Number of Events and Anticipations

Reported by the 50 Male Respondents



subjects.

The number of events and anticipated events reported in each ADE category is presented in Table 2. Frequencies of actual events ranged from a low of 3 (fired or quit) to a high of 2,147 (close interaction with spouse). For anticipated events the range was from 0 (witnessing an unusual event) to 202 (change in job). There were 408 written-in events, 2% of the total. Content of the write-ins was quite varied with the exception of reports of religious activities/experiences (125), recuperating from an illness (23), and spouse ill (22).

The frequency with which events and anticipated events were reported in the ADE's major categories, over equal thirds of the reporting period, is presented in Table 3. For five of the six categories there was a drop in number of events reported from the first to the middle recording period. The percent reduction in events reported were: Work - 29%, Leisure - 12%, Financial - 9%, Family and Friends - 12% and Other - 33%. As can be seen from the Table, the principal drop in rate of event reporting occurs as we move from the first to the second third of the data. There is very little difference between the middle and the last third. For anticipations, there was also a decline in reporting frequency for three categories as subjects moved from the first to the second third of the recording period. A 34% reduction was observed in the Leisure category, a 12% drop in Family and Friends, and a 48% drop in Other. Four of the categories also were used less frequently in the last as compared to the middle period. Percent reductions were as follows: Work - 45%, Financial - 18%, Family and Friends - 41%, and Other - 41%.

Qualities of Event Report

Every checked event was rated by participants on four scales: desirability-undesirability, change-stabilizing, meaningfulness and control. It was possible that the quality described by each dimension did not apply to the checked item and in such cases the participant was asked to use a "not applicable" rating. For desirability-undesirability, subjects used NA only two percent of the time. The mean rating on the scale was 5.5 which translates to an adjective rating of slightly less than "moderately" desirable. For changing-stabilizing, subjects found the dimension not applicable 29 percent of the time, and it received an average rating of 8.1 which translates to an adjective rating of about "slightly stabilizing." For meaningfulness, subjects did not use the dimension 14 percent of the time and it received an average rating of 4.6 or a rating of somewhere between "moderately" and "very" meaningful. Finally, subjects did not use the control dimension two percent of the time and it received an average rating of 2.8 or a rating of "some" control over the event's occurrence.

The distributions of responses for each rating dimension are shown in Figures 2 through 5. Clearly, most of the events reported were viewed as desirable with a modal value of "very" desirable (see Figure

Table 2

Actual and Anticipated Events
Reported in Each ADE Category
(N = 50)

		Events	Anticipations
WORK RELATED ACTIVITIES			
Concerning Boss, Supervisor, Upper Management, Ect.			
1.	Praised for a job well done	244	10
2.	Criticized for inadequate work, lateness, etc.	52	14
3.	Employees not working well	86	23
4.	Emotional interactions with co-workers, employees, clients	788	11
5.	Firing or disciplining (by T)	17	16
6.	Socializing with staff, co-workers, clients	708	13
General Happenings Concerning Target at Work			
7.	Promotion, raise	18	44
8.	Fired, quit, resigned	3	48
9.	Some change in job	214	202
10.	Under a lot of pressure at work	554	35
LEISURE ACTIVITIES			
Physical			
11.	Done along, primarily non-competitive	605	30
12.	Social leisure activities, primarily competitive	354	34
Non-Physical			
13.	Out alone	48	2
14.	Dining or entertaining at home or out	878	38
15.	Club or group meeting	202	14
16.	Out with friends	393	18
Vacation			
17.	Spent at home	242	12
18.	Spent away from home	171	137
Outings			
19.	Beach, park, picnic, fishing, museums, auto show, ball game, etc.	197	52
Personal			
20.	Self improvement	195	10
21.	Hobbies, reading, letter writing	1266	21
FINANCIAL ACTIVITIES			
22.	Loans	31	19
23.	Investing	63	32
24.	Major selling	12	54
25.	Major buying	52	121
26.	Inheritance or windfall	18	14
27.	Financial problems	133	120
FAMILY AND FRIEND ACTIVITIES			
Concerning Target and Spouse			
28.	Close interaction with spouse	2147	13
29.	Sexual interaction	777	186
30.	Not getting along well with spouse	164	5

31.	Arguments or reprimands from spouse	315	3
32.	Praise from spouse	356	1
33.	Spouse away	74	7
34.	Pregnancy or birth in family (daily reaction)	84	284
Concerning Children			
35.	Disciplinary problems	204	5
36.	Children getting along well together or with peers	1051	1
37.	Children have some special achievement	253	6
38.	Children have disappointment or failure	62	3
39.	Problems at school	39	4
40.	Children away from home	281	29
41.	You are getting along well with children	1656	13
42.	Children sick or injured	220	10
Concerning Relatives			
43.	General contact with relatives	1110	30
44.	Relatives sick or death of relative	271	23
45.	Visit with relatives	703	56
46.	Problems getting along with relatives	34	7
Concerning Friends and Neighbors			
47.	Death of friend, neighbor or acquaintance	26	12
48.	Helping a friend, neighbor or acquaintance	285	16
49.	Problems with friend, neighbor or acquaintance	22	4
50.	Especially good interactions with friend, neighbor or acquaintance	585	4
Family Duties			
51.	General housework	1211	24
52.	Other family-related duties away from home	1219	25
OTHER ACTIVITIES AND HAPPENINGS			
Concerning Target			
53.	Not meeting up to self-expectations, but not a previously checked item	95	29
54.	Accomplishing goals or meeting self-expectations	417	3
55.	Minor personal problem, or frustration	302	8
56.	Major personal problem, but not a previously checked item	58	16
57.	Illness or injury to yourself	121	5
58.	Visit to health care worker for bodily complaint	36	17
59.	Visit to health care worker for psychological complaint	19	6
60.	Weather getting to you	265	6
61.	Daily routine getting to you	140	10
62.	Traveling problems	149	1
63.	Witnessed something unusual	42	0
64.	Write in	408	10

Table 3

Number of Events and Anticipations Reported in ADE Summary Categories Over Equal Thirds of the 90 Day Reporting Period (N = 47)

ADE Categories	Time Period: First		Middle		Last	
	Events	Anticipations	Events	Anticipations	Events	Anticipations
Work	1030	157	732	157	835	86
Leisure	1627	140	1434	92	1325	108
Financial	90	113	73	114	93	94
Family & Friends	4588	279	4020	219	4007	185
Other	682	52	458	27	459	16
Write-ins	109	1	130	1	138	2

Note: Only 47 of the 50 subjects were used in this table because 3 subjects had a smaller than average number of recording days (Ns = 44,43,40)

2). For changing stabilizing, the modal value was "somewhat" stabilizing with very few events being either extremely changing or extremely stabilizing (see Figure 3). The distribution of responses for the meaningfulness dimension is much closer to rectilinear compared with the previous two histograms if one omits the very low response rating rate for the immeasurably meaningfulness point. The modal value on meaningfulness was "very" (see Figure 4). The modal value for the control dimension was "some control" and either extreme, that is complete control or no control, received about equal usage (see Figure 5).

There are several kinds of comparisons which were made among the rating dimensions. We first compared the events which were rated as anticipated versus those that were rated as occurring. This was done by comparing the expected values that the anticipated events should have at each adjective level estimated from the values of occurred events. For example, if at a particular adjective value there are 1,000 occurred events, there should be 100 anticipated events because there is roughly a 10 to 1 ratio between anticipated and occurred events. Large deviations from the expected values are reported here. On the desirability dimension there were many more anticipated events at the immeasurably desirable level and there were many fewer anticipated events at the slightly desirable, slightly undesirable and immeasurably undesirable levels. On change-stabilizing, there were many more anticipated events on the extremely, quite, very, and moderately changing levels and fewer events on the very and immeasurably stabilizing side of the scale. On the meaningfulness scale, there were fewer anticipated events at both the immeasurably meaningful and the slightly meaningful ends of the distribution. There were no major deviations on the control dimension.

The relationships between the rating dimensions are presented in several cross tabulations. Adjectives have been combined to make the tabulations clearer. As an event becomes more desirable it is rated as either more changing or more stabilizing, yet as events become less desirable they tend to be rated as more changing but not as more stabilizing (see Table 4). Events rated as extremely changing or stabilizing tended to be rated as highly meaningful whereas events which receive lower ratings on the change-stabilizing dimension tend to be less meaningful (see Table 4). Events which are rated at the higher ends of either desirability or undesirability tend to be more meaningful whereas the events which are rated only somewhat or slightly desirable or undesirable have lower meaningfulness ratings (see Table 5). Events which are rated as more desirable are perceived as being within a person's control and, conversely, events which are rated as less desirable are perceived as being out of the participants' control (see Table 5). There is little relationship between control and changing-stabilizing (see Table 5) or between control and meaningfulness (Table 6).

Another way of examining the interrelationships among the event

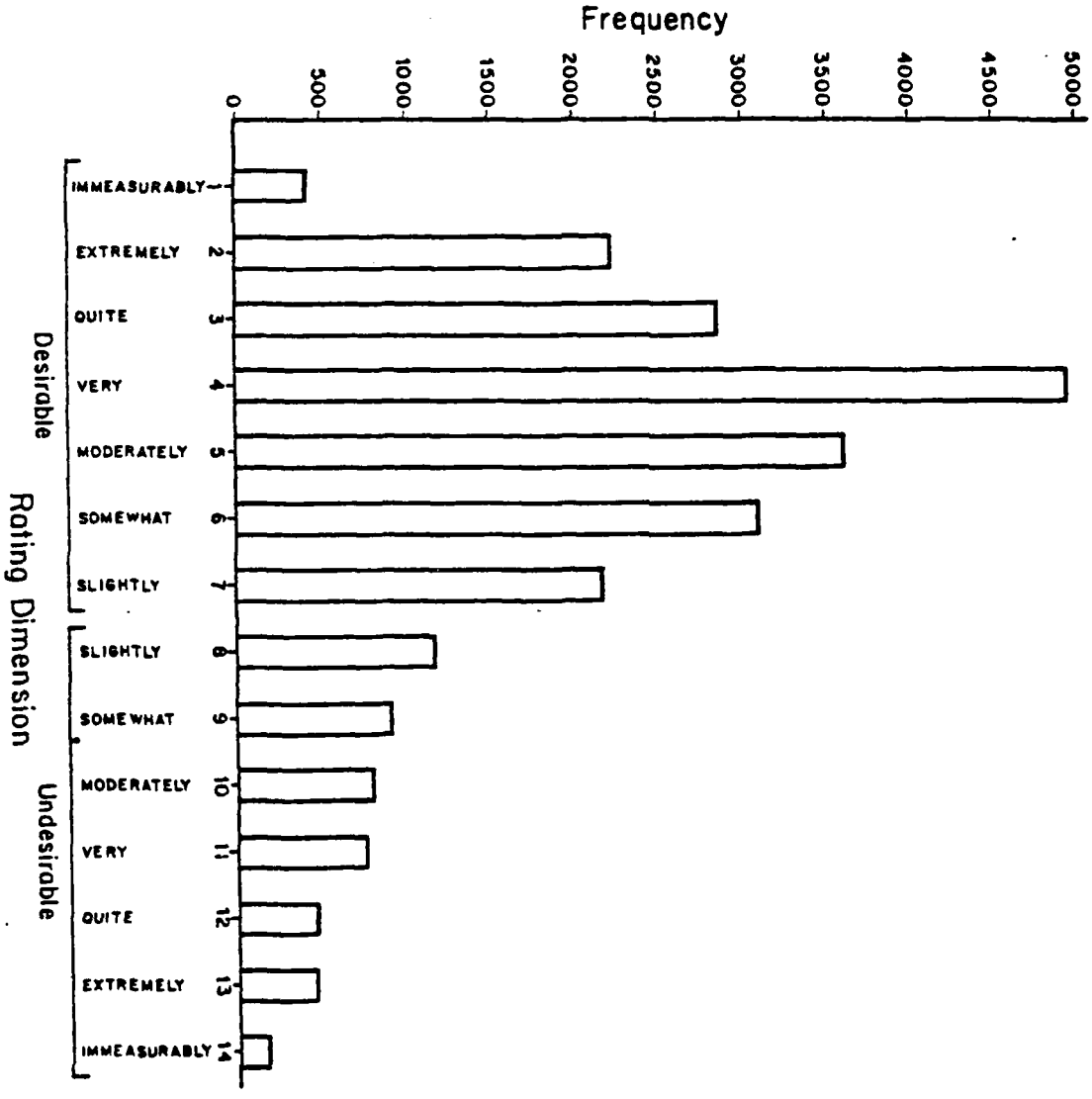


Figure 2

Distribution of Desirable-Undesirable Event Ratings (N = 24,140)

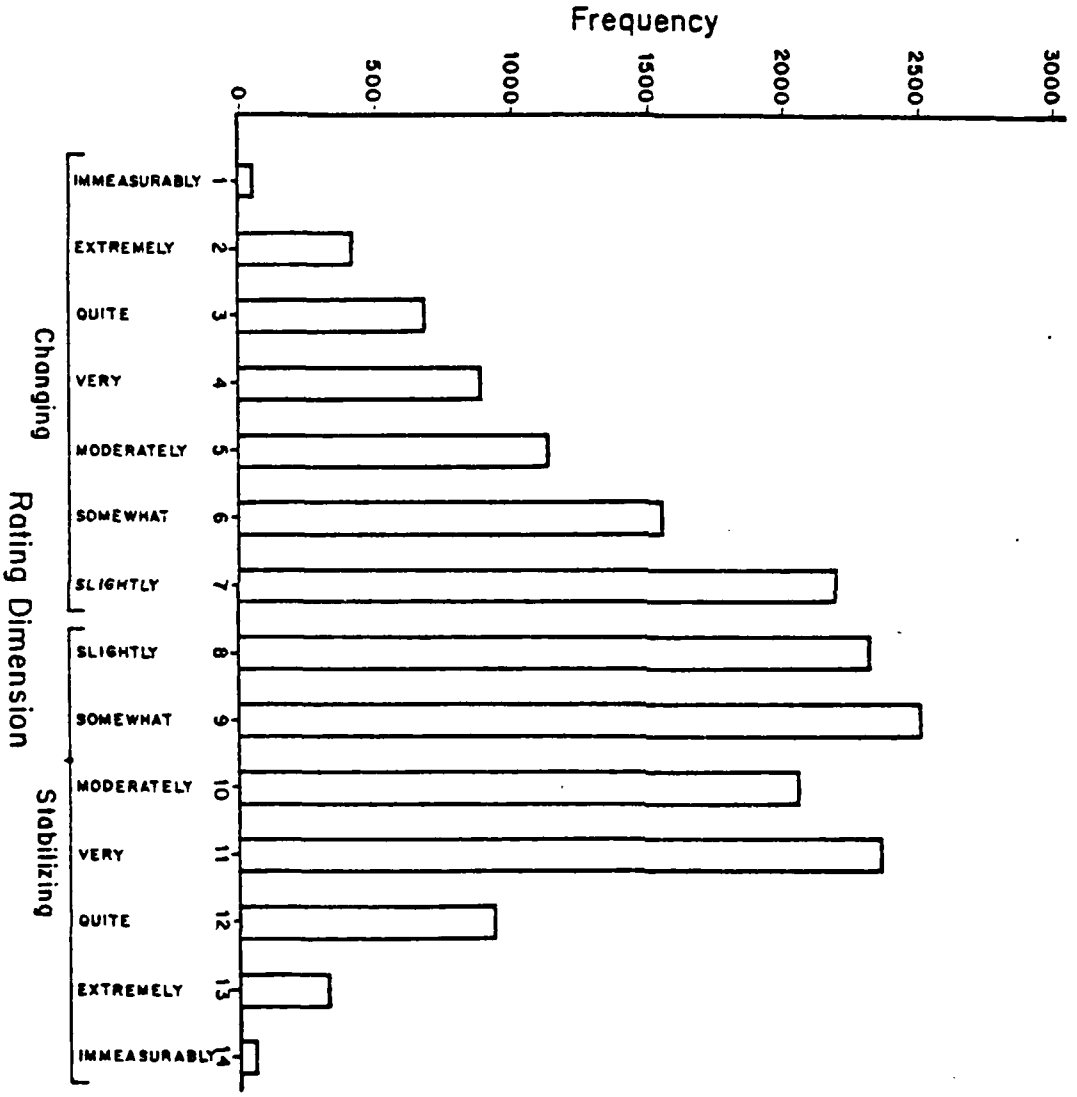


Figure 3

Distribution of Changing-Stabilizing Event Ratings (N = 17,567)

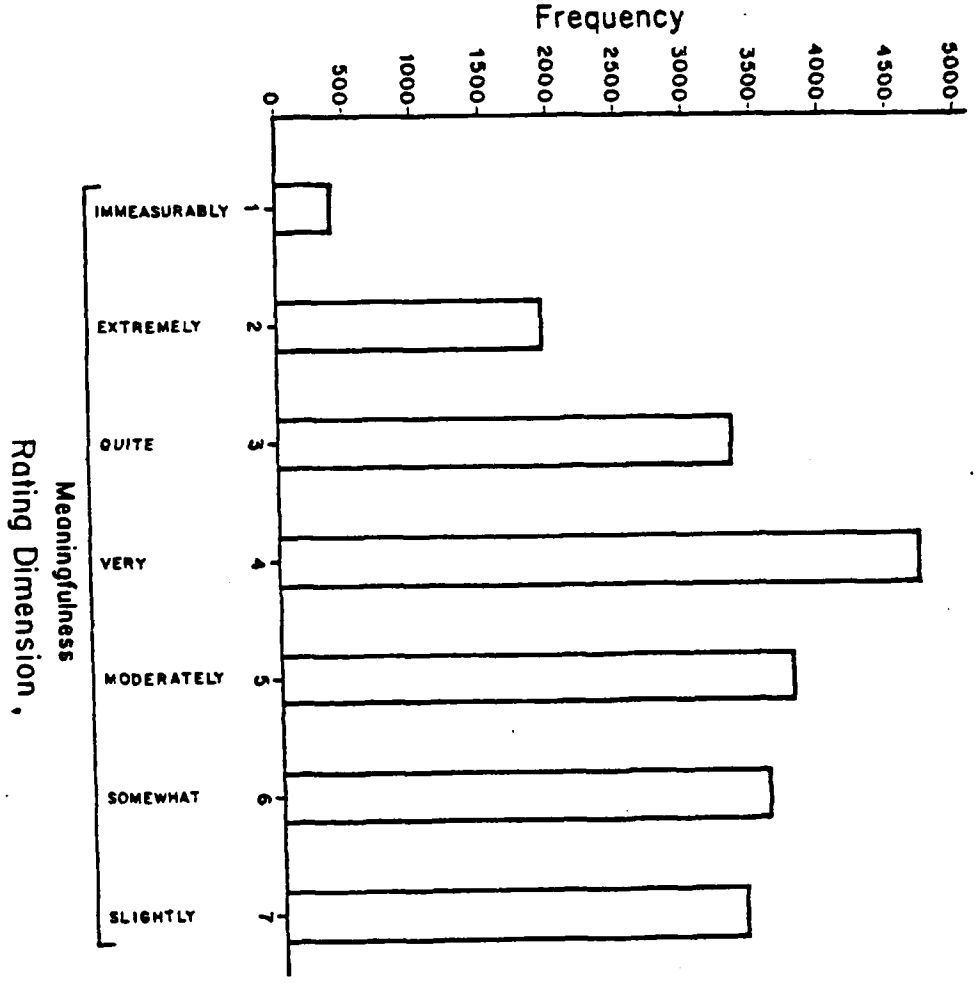


Figure 4

Distribution of Meaningfulness

Event Ratings (N = 21,192)

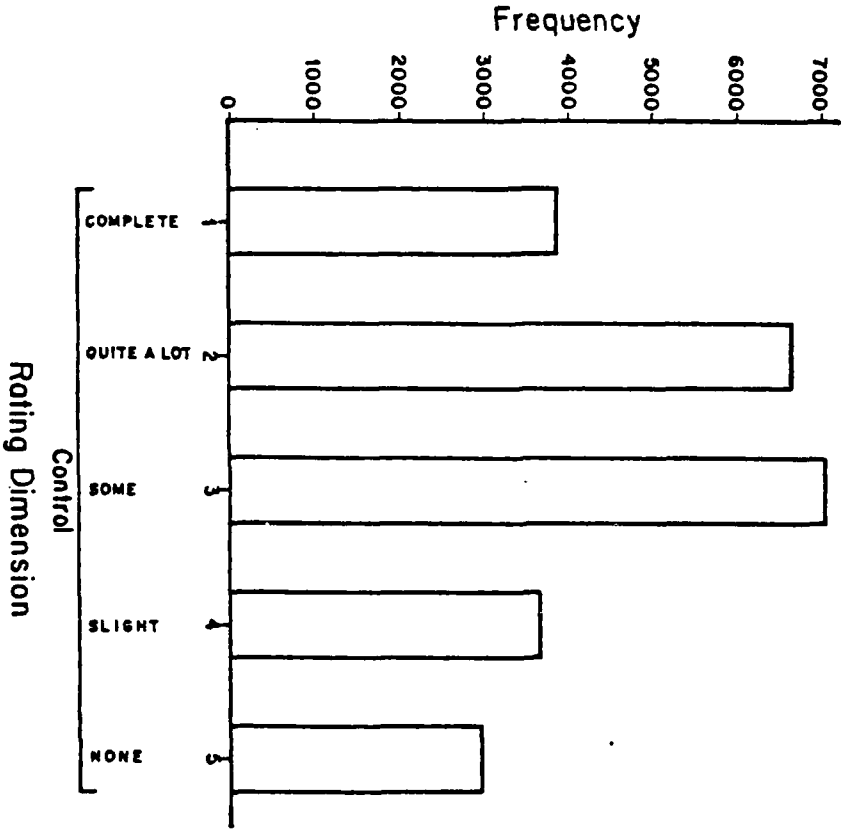


Figure 5

Distribution of Control

Event Ratings (N = 24,135)

Table 4

Crosstabulation of Daily Events:
Changing/Stabilizing With Desirability, Meaningfulness, and Control

		Changing			Stabilizing		
		High	Medium	Low	Low	Medium	High
Desirable	High	556	475	416	403	1043	1233
	Medium	310	635	660	1883	3070	87
	Low	25	124	1048	2221	239	1
Undesirable	Low	22	87	733	307	23	2
	Medium	44	412	558	34	23	5
	High	204	280	299	11	9	4
	Total						17,486
Meaningfulness	High	862	640	460	334	828	1133
	Medium	239	950	1053	1520	3106	117
	Low	26	313	1859	2715	424	5
	Total						16,654
Control	High	168	175	328	883	673	150
	Medium	751	1524	2732	3551	3346	1097
	Low	234	297	624	403	333	64
	Total						17,333

Table 5

Crosstabulation of Daily Events:
Desirable/Undesirable With Meaningfulness, and Control

		Desirable			Undesirable		
		High	Medium	Low	Low	Medium	High
Meaningfulness	High	3958	992	109	68	149	378
	Medium	1192	5492	691	248	525	295
	Low	182	1544	3535	1033	513	168
	Total						21,072
Control	High	943	1476	1042	209	38	37
	Medium	4258	6151	3852	1323	997	559
	Low	245	813	356	516	476	501
	Total						23,792

Table 6

Crosstabulation of Daily Events:
Meaningfulness with Control

		Control		
		High	Medium	Low
Meaningfulness	High	854	4233	525
	Medium	1192	6239	943
	Low	1122	5082	747
	Total			20,937

rating dimensions is by correlation coefficients. Because the relationships between the bipolar scales (desirability-undesirability and changing-stabilizing) are not linear, as was shown in the cross tabulations, each of the bipolar dimensions was broken down into two unipolar scales. Since an event could only be rated on one of those bipolar scales at a time, correlations between each of these newly created unipolar scales and another dimension (for example, desirability and control versus undesirability and control) use different sets of events (no single event occurrence could be both desirable and undesirable). The same point applies to the changing-stabilizing events. The correlation matrix for these six unipolar scales is presented in Table 7. Desirability has very strong relationships with both stability and meaningfulness, a moderate relationship with change and a rather weak relationship with control. The correlation between undesirability and the other dimensions revealed a similar but somewhat weaker pattern of relationships with changing, stabilizing, and meaningfulness. However, the relationship between undesirability and control, although rather small, is in the opposite direction; events which are viewed as more undesirable are also viewed as less controllable. The change dimension correlates moderately positively with meaningfulness and weakly with control. Likewise, the stabilizing dimension has a moderate positive relationship with meaningfulness and little association with control. Finally, meaningfulness has only a small relationship with control.

A further breakdown of dimensional ratings by specific event content, the 66 ADE items, is presented in Table 8. The data in this table present the average level of ratings on a particular dimension and the variability of the ratings around the mean. This table is useful for locating events with particular properties on the rating dimension for more specific analyses.

Daily Assessment of Mood

Mood was assessed daily by means of the 36 adjective, short version of the Nowlis Mood Adjective Checklist (MACL; Nowlis, 1965). The short form of the MACL yields 12 mood scales based on four-point ratings of each adjective (1=adjective definitely does not apply; 2=not sure; 3=applies slightly; 4=definitely applies). The instructions were modified for daily recording: rather than describing mood at the moment the form was being completed we asked that both target and observer describe the target's feelings or mood for the entire day. Though both target- and observer-reported mood data have been collected, only target-reported data will be reported here (for an analysis of target-observer reports, see Stone, in press).

For the 50 "complete" subjects the means and standard deviations for the 12 Nowlis mood scales are presented in Table 9. These figures are the averages of individuals's means and standard deviations across the recording period.

Table 7

Correlations Among Event Rating Dimensions

	Desirable	Undesirable	Changing	Stabilizing	Meaningful	Control
Desirable	+100					
Undesirable	na	+100				
Changing	+52	+48	+100			
Stabilizing	+70	+51	na	+100		
Meaningful	+80	+57	+62	+70	+100	
Control	+11	-16	+12	+1	+12	+100

Note. Each pole of the two bipolar scales (desirable/undesirable and change/stable) have been considered separately and all scales have been coded so that higher scores mean more of the attribute.
All correlations except the +1 are significant at the .05 level.
Decimal points have been omitted.

Table 8

Means, Standard Deviations, and Ns of Rating Dimensions for Each Event

	Desirable / Undesirable			Changing / Stablizing			Meaningfulness			Control		
	M	SD	N	M	SD	N	M	SD	N	M	SD	N
WORK RELATED ACTIVITIES												
Concerning Boss, Supervisor, Upper Management, Etc.												
1. Praised for a job well done	4.5	1.4	243	7.8	2.3	188	5.0	1.7	224	3.0	1.1	237
2. Criticized for inadequate work, lateness, etc.	11.1	1.4	51	5.9	1.4	34	5.6	1.3	45	3.6	1.0	52
3. Employees not working well	10.4	1.9	85	5.4	1.4	54	4.7	1.2	72	3.9	.9	86
4. Emotional interactions with co-workers, employees, clients	6.2	2.3	775	7.3	2.3	469	5.3	1.4	689	3.0	.9	778
5. Firing or disciplining (by T)	9.1	2.1	17	6.4	2.0	9	5.7	1.2	15	1.8	.9	17
6. Socializing with staff, co-workers, clients	5.8	1.3	700	7.5	1.8	382	6.0	1.2	616	2.6	.9	700
General Happenings Concerning Target at Work												
7. Promotion, raise	3.1	1.4	17	7.4	2.7	16	4.3	1.6	17	2.5	1.0	17
8. Fired, quit, resigned	7.0	2.0	3	3.7	2.9	3	2.7	.6	3	2.3	1.5	3
9. Some change in job	5.9	2.5	209	6.1	2.0	178	5.1	1.7	159	3.1	1.1	211
10. Under a lot of pressure at work	8.9	2.1	541	6.1	1.4	309	5.6	1.4	403	3.6	1.1	542
LEISURE ACTIVITIES												
Physical												
11. Done alone, primarily non-competitive	4.5	1.4	599	8.4	1.7	471	4.7	1.5	556	1.3	.7	601
12. Social leisure activities, primarily competitive	4.2	1.5	350	8.4	2.4	261	4.7	1.4	307	2.1	.9	349
Non-Physical												
13. Out alone	5.1	2.6	47	7.6	2.5	21	4.5	1.9	39	2.1	1.3	48
14. Dining or entertaining at home or out	4.4	1.5	867	8.3	2.4	537	4.7	1.5	787	2.7	1.0	869
15. Club or group meeting	4.5	1.4	201	9.5	2.2	163	4.5	1.3	187	3.1	1.0	200
16. Out with friends	4.4	1.5	389	8.1	2.5	271	4.8	1.5	352	2.6	.9	388
Vacation												
17. Spent at home	4.4	1.6	241	9.1	2.5	145	4.1	1.5	158	1.9	1.1	242
18. Spent away from home	3.4	2.0	169	7.4	4.0	145	3.5	1.8	156	2.2	.9	168
Outings												
19. Beach, park, picnic, fishing museums, auto show, ball game etc.	4.1	1.7	195	8.3	2.9	137	4.3	1.7	167	2.3	1.0	196

Personal												
20.	Self improvement	5.3	1.9	195	7.7	2.3	168	5.2	1.5	183	2.5	1.2	194
21.	Hobbies, reading, letter writing	5.1	1.5	1256	8.6	1.6	945	5.3	1.5	1073	1.7	.9	1258
FINANCIAL ACTIVITIES													
22.	Loans	6.6	3.5	28	6.9	3.2	20	3.9	1.6	24	2.9	1.4	30
23.	Investing	5.6	1.3	51	6.9	1.5	16	5.4	1.5	20	1.3	.6	63
24.	Major selling	3.9	1.4	12	6.3	2.2	9	5.6	1.0	10	1.8	.6	12
25.	Major buying	5.1	2.1	52	6.4	3.1	38	4.8	1.9	38	2.5	1.0	51
26.	Inheritance or windfall	3.1	1.8	17	6.3	3.6	18	3.5	2.0	16	3.3	1.4	17
27.	Financial problems	10.1	2.0	132	6.2	1.2	116	5.5	1.6	112	3.8	.9	131
FAMILY AND FRIEND ACTIVITIES													
Concerning Target and Spouse													
28.	Close interaction with spouse	3.8	1.5	2137	9.1	2.5	1807	3.9	1.4	2125	2.7	.8	2118
29.	Sexual interaction	2.9	1.3	777	9.4	3.1	584	3.2	1.4	744	2.3	.8	765
30.	Not getting along well with spouse	10.6	2.0	164	5.4	1.9	122	4.5	1.7	139	3.5	.8	161
31.	Arguments or reprimands from spouse	10.4	2.0	310	5.7	1.8	218	5.0	1.7	250	3.4	.9	303
32.	Praise from spouse	3.9	1.2	349	9.4	2.0	284	4.2	1.3	343	3.7	1.2	336
33.	Spouse away	7.2	3.3	67	7.8	2.8	58	4.4	1.7	62	3.4	1.1	66
34.	Pregnancy or birth in family (daily reaction)	4.8	1.7	84	6.7	3.2	84	3.3	1.3	84	4.3	.8	78
Concerning Children													
35.	Disciplinary problems	10.0	1.8	201	5.9	1.5	133	5.1	1.6	145	3.4	1.0	200
36.	Children getting along well together or with peers	3.7	1.3	1044	10.0	1.9	861	3.9	1.4	1016	3.8	1.1	991
37.	Children have some special achievement	3.9	1.5	248	8.6	2.4	203	4.2	1.6	242	4.3	.9	237
38.	Children have disappointment or failure	9.9	1.6	59	6.4	1.5	38	5.2	1.7	47	4.3	.9	60
39.	Problems at school	9.9	1.7	39	5.9	1.9	27	5.2	1.6	29	4.3	1.0	38
40.	Children away from home	5.8	2.2	231	8.0	2.5	181	4.6	2.0	212	2.5	1.3	231
41.	You are getting along well with children	3.7	1.4	1641	9.8	2.5	1384	3.8	1.4	1632	2.8	0.8	1635
42.	Children sick or injured	10.0	2.2	215	6.5	1.8	125	4.8	1.6	132	4.8	.5	198
Concerning Relatives													
43.	General contact with relatives	5.5	1.8	1034	8.2	2.0	626	5.0	1.5	904	3.0	1.4	1054
44.	Relatives sick or death of relative	10.0	3.3	269	5.3	1.5	239	5.0	1.4	248	4.2	1.0	258
45.	Visit with relatives	5.0	1.6	685	7.9	2.4	505	4.9	1.5	615	2.8	1.1	686
46.	Problems getting along with relatives	10.8	2.0	33	5.6	2.2	23	4.7	1.6	30	3.7	1.1	33

Concerning Friends and Neighbors															
47.	Death of freind, neighbor or acquaintance	11.4	1.9	23	6.2	1.1	11	4.7	1.7	19	5.0	0.0	20
48.	Helping a friend, neighbor or acquaintance	5.3	1.5	270	8.7	2.0	174	5.1	1.3	242	2.5	1.0	280
49.	Problems with friend, neighbor or acquaintance	10.8	2.0	22	5.8	1.7	12	4.9	1.6	14	3.7	1.6	19
50.	Especially good interactions with friend, neighbor or acquaintance	4.3	1.3	578	8.6	.3	445	4.6	1.4	561	2.7	0.9	579
Family Duties													
51.	General Housework	6.4	1.9	1148	8.0	2.0	666	5.5	1.4	825	2.0	1.1	1206
52.	Other family-related duties away from home	6.4	1.8	1117	8.1	1.9	614	5.6	1.4	829	2.2	1.0	1202
OTHER ACTIVITIES AND HAPPENINGS													
Concerning Target													
53.	Not meeting up to self-expectations, but not a previously checked item	10.9	2.3	95	6.2	1.3	69	4.8	1.6	91	2.7	1.1	95
54.	Accomplishing goals or meeting self-expectations	4.4	1.6	415	8.6	2.6	380	4.6	1.5	399	2.5	1.1	415
55.	Minor personal problem, or frustration	10.0	2.1	297	6.0	1.4	188	5.2	1.6	201	3.8	1.1	299
56.	Major personal problem, but not a previously checked item	11.4	2.1	57	4.9	2.7	50	3.6	1.6	49	4.3	1.1	56
57.	Illness or injury to yourself	11.4	2.0	121	4.7	2.0	80	3.8	2.1	70	4.2	1.3	117
58.	Visit to health care worker for bodily complaint	7.3	3.6	33	6.1	2.7	28	4.1	1.3	29	2.2	1.4	36
59.	Visit to health care worker for psychological complaint	5.4	1.5	19	6.4	1.8	19	5.4	1.2	19	3.4	1.0	19
60.	Weather getting to you	10.5	1.8	262	5.5	1.7	161	5.6	1.5	138	4.6	0.7	253
61.	Daily routine getting to you	9.9	1.9	137	5.3	1.3	63	4.9	1.4	77	4.0	1.0	132
62.	Traveling problems	10.1	2.2	148	5.4	1.6	70	5.6	1.5	92	4.5	0.8	145
63.	Witnessed something unusual	8.6	3.4	34	6.9	2.0	21	5.0	1.6	33	4.5	0.9	39
64.	Write In	5.6	3.2	364	7.9	3.2	308	4.4	1.5	315	2.7	1.6	361
65.	Write In	4.6	3.2	31	7.9	3.2	26	3.6	1.1	28	2.7	1.4	29
66.	Write In	3.8	1.6	6	5.5	3.1	4	4.2	1.8	6	3.8	1.9	4

Note: For the bipolar scales, desirable/undesirable and changing/stablizing, the left hand concept (desirable or changing) was modified as follows: 1=immeasurable, 2=extremely, 3=quite, 4=very, 5=moderately, 6=somewhat, and 7=slightly; and the right hand concept (undesirable or stablizing) was modified as follows: 8=slightly, 9=somewhat, 10=moderately, 11=very, 12=quite, 13=extremely, and 14=immeasurably. Meaningfulness was modified by adjectives 1 through 7. Control had a different set of adjectives: 1=complete, 2=quite a lot, 3=some, 4=slight, and 5=none.

Table 9

Means and Standard Deviations for Targets's Mood Scales

Nowlis Mood Scale	Mean	Standard Deviation
Aggression	1.36	.64
Anxiety	1.29	.55
Surgency	1.95	.87
Elation	1.96	.92
Concentration	2.35	1.01
Fatigue	1.65	.79
Vigor	2.35	.93
Social Affection	2.28	.98
Sadness	1.28	.58
Skepticism	1.34	.59
Egotism	1.30	.53
Nonchalance	1.81	.74

To facilitate analysis of the mood data with respect to events, the 12 Nowlis scales were factored to reduce the number of mood variables needed in subsequent analyses. A principal component factor analysis using the targets's mood scale scores was computed and was followed by an orthogonal rotation (varimax). Three factors with eigenvalues greater than 1.0 were retained and accounted for 66% of the total variance in mood. Factor loadings of the 12 scales on these three factors are presented in Table 10.

Factor 1, which includes the aggression, anxiety, fatigue, skepticism and sadness scales, has been labeled Negative Engagement (NE) given the generally undesirable tenor of the original scales. Factor 2 has been labeled Positive Engagement (PE) because it is made up of surgency, elation, social affection and nonchalance. The third factor has been labeled Activation and is made up of concentration and vigor. One Nowlis scale, egotism, did not load highly on any factor. For simplicity, factor scores were computed for each subject by unweighted averaging of the raw scores of the Nowlis scales comprising each factor.

Because very few studies have employed the Nowlis MACL for daily recording over an extended period of time, and because Nowlis (1965) had warned of the possibility of response stereotyping with such a procedure, we examined both level (means) and variability (standard deviations) of responding over the 90 day period. The data were split into thirds: each subject's number of recording days was divided into three equal parts. Three subjects with a smaller than average number of recording days (N's = 44,43,40) were excluded from this analysis since their thirds would not have been equivalent to the other subjects's thirds. Means and standard deviations of each third of data, computed between subjects, appear for the 12 Nowlis MACL scales and the three derived mood factors (see Table 11).

An analysis of variance was performed on the data for each scale and factor as well as eta squared. In addition, a t-test was calculated on adjacent pairs of data groupings on each scale. Seven out of 45 comparisons were significant at $p < .05$ (see Table 11). Six of these changes reflected a slightly higher mean score in the later third, while only one change was from a higher to a lower mean score. The eta squared indicated that the breakdown by thirds accounted for very little mood variance. In all cases when the adjacent thirds of data were significantly different, the standard deviation of the later third was greater than that of the earlier third, an effect opposite to what would be expected if responses were becoming more stereotyped over time.

Coding of Symptom Data

Daily symptoms were coded using a checklist format where subjects checked those symptoms that they had experienced during the day. They also rated the severity of each checked symptom on a 7-point scale. For the longitudinal analysis, we condensed this information by coding

Table 10

Variables Marking Rotated *Mood Factors for* Targets's Self-Report of Mood

	Factor		
Nowlis Mood Scales	1	2	3
Aggression	.76		
Anxiety	.78		
Fatigue	.66		
Sadness	.71		
Skepticism	.69		
Surgency		.85	
Elation		.81	
Social Affection		.67	
Nonchalance		.82	
Concentration			.70
Vigor			.76
Egotism	--	--	--
Percent of Variance Explained	42	15	8

Note: Factor loadings between -.50 and +.50 are omitted.

Table 11

Means and Standard Deviations Between Subjects for Nowlis Scales and Mood Factors, Each Subject's Data Split into Thirds

Nowlis Scales or Mood Factor	1st Third M	1st Third SD	2nd Third M	2nd Third SD	3rd Third M	3rd Third SD
Aggression	1.37	(.64)	1.34	(.63)	1.35	(.64)
Anxiety	1.28	(.52)	1.29	(.55)	1.32	(.57)
Surgency	1.95	(.85)	1.97	(.89)	1.92	(.88)
Elation	1.95	(.88)	1.97*	(.93)	1.97	(.94)
Concentration	2.36	(1.00)	2.30	(1.02)	2.40	(1.02)
Fatigue	1.65	(.79)	1.65	(.78)	1.66	(.80)
Vigor	2.46	(.94)	2.27	(.92)	2.30	(.91)
Social Affection	2.24	(.96)	2.29	(.99)	2.31	(.99)
Sadness	1.26	(.56)	1.30*	(.60)	1.29	(.58)
Skepticism	1.32	(.57)	1.33	(.58)	1.37*	(.63)
Egotism	1.28	(.51)	1.27	(.50)	1.35*	(.58)
Nonchalance	1.79	(.68)	1.85*	(.74)	1.80*	(.79)
Negative Engagement	1.38	(.41)	1.38	(.42)	1.40	(.44)
Positive Engagement	1.98	(.69)	2.02*	(.74)	2.00	(.74)
Activation	2.41	(.81)	2.29	(.81)	2.35	(.82)

* Difference between this and adjacent (previous) third of data is significant, 2-tailed $p < .05$.

Note: Eta Squares for all scales and factors is less than .001.

daily symptoms as either episodes or as individual symptoms. Episodes were coded separately because they involved several days of similar symptoms, whereas "individual" symptoms were isolated occurrences of particular symptoms. The distinction between episodes and symptoms is relevant for the causal analysis because we would only want to predict to episode onset. Episodes were defined as follows:

1. Three consecutive days of logically related symptoms. For example, a headache on day 1, followed by the report of a cold on days 2 and 3 would be satisfactory to define the start of an episode.
2. Once an episode had started, we allowed for skips in symptom report of up to 2 days in duration. Thus, one could have an episode start in the first 3 days, have a skip of up to 2 days in symptom report, followed by several days of the same symptoms. We allowed these 2 day skips because we did have missing data, and because we also wanted to allow for the fact that people could inadvertently omit a symptom report.

Of the 50 subjects, five reported daily symptoms for many consecutive days, far longer than the average episode duration. In fact, two of these subjects reported symptoms almost every day. Since our strategy was to predict individual symptoms from previous daily events, we decided to drop those people with constant symptom report, referred to as "one big episode" subjects.

There were forty episodes reported, an average of slightly less than one per subject. Episodes lasted an average of 12.90 days. Types of episodes and their frequencies are presented in Table 12. Overall, 376 individual symptom days were reported, an average of one day in ten (the five subjects with one big episode were excluded from this figure). On these 376 days, 1338 symptoms were reported, an average of 3.56 symptoms per symptomatic day. Table 13 lists the symptoms and their individual frequencies for the total sample (N = 50) and for the sample without one big episode responders (N = 45). Table 14 presents a summary of the symptoms and episode response rates.

We were also interested in how symptom reports changed over time. The number of days with a symptom, with a start of an episode, or with a symptom that was part of an ongoing episode were all examined. The sample used here eliminated the five subjects with one big episode and the three respondents with less than 50 days of data resulting in a N of 42. Table 15 presents these data. Symptomatic days dip in the second third, but substantially recovers in the last third. The variable start episodes declines in the final third, as do episodic days. We also find that the average number of days in an episode drops from the first to the second third.

Characterizing Daily Event Information for the Longitudinal Analysis

The process of transforming daily event information into numerical

Table 12

Types and Frequencies of Episodes

Type	Frequency
Hay Fever	5
Cold (reported as such)	16
Cold Syndrome (adjudged by us as a cold, but not reported by the subject as a cold)	1
Cold (reported as such) with other symptoms including eye and ear infections	5
Flu syndrome (must include four of six: fever, G.I. symptoms, headache, nausea, sore throat, body ache)	2
Body Ache	2
Hemorrhoids	1
Constipation	1
Stomach Ache	1
Sore Throat	2
Cold Sore	4

Table 13

Frequency of Reporting of Individual Symptoms

Symptom Type	Frequency	
	N = 50	N = 45
Head aches; dizziness	268	162
Aches; body aches; sore elbows, etc.; arthritis	708	221
Diarrhea; constipation	78	61
Hay fever; asthma; emphysema	192	82
Stomach aches; nausea; heart burn	129	100
Cold; stuffed up head and nose; sore throat; sinus infection; bronchitis	487	337
Acne; cold sore; carbunkle	64	61
Other symptoms: bursitis, lumago, hemorrhoids, abscessed tooth, infected eye, chest pain	279	201
Symptoms which were explained by drinking/drugs/physical actions (i.e. burns) all of which were reported by the subject as such.	154	113
Total	2359	1338

Note: N = 45 - exclusion from the count of symptoms of five subjects who reported being in continual 'episodes'.

Table 14

Symptom and Episode Reporting

Number of Symptoms Reported	2,359 in 4,295 days 1,338 in 3,922 days	(N = 50) (N = 45)
Number of Days with One or More Symptoms (not Episodes)	376 of 3,922 days	(N = 45)
Number of Days with an Episode Start	40 of 3,922 days	(N = 45)
Number of Days that were part of an Episode	493 of 3,922 days	(N = 45)
Number of Days with Either an Episode or a Symptom	869 of 3,922 days	(N = 45)

Note: N = 45 - exclusion from the count of symptoms of five subjects who reported being in continual 'episodes'.

Table 15

Symptom and Episode Report by Thirds

	Thirds		
	1-30	31-60	61-90
Symptom Days(N=47)	114	73	100
Start of Episodes (N=42)	16	15	9
Episodic Days (N=42)	226	165	98
Days with either Symptom or Episode	340	238	198
Average number of Days in an Episode (includes start of episode days)	14.13	11.00	10.89

indices was complex because we had five different event qualities as well as the event content (for example, work and family activities) to handle. We felt that the psychological impact of an event, reflected by the rating dimensions, would affect mood and symptoms more than the specific, "objective" event content. We therefore decided to create indices based on the event quality dimensions rather than the event content itself for our first try at detecting relationships among events, mood, and symptoms. Our decision to do this was buttressed by our previous analysis of the events (Table 8) in that we found that a particular event could receive a wide variety of ratings on the dimensions, indicating that the events did not have a "standard" psychological impact.

There were many ways which we could have combined the dimensional information. One of our initial plans was to create a multiplicative index which combined all of the rating dimension information simultaneously. We had planned to do this by substituting psychophysical ratings of each of the anchoring adjectives, namely, letting a number represent the degree of intensity for extremely, quite, very, etc. Then, each event could be represented as the product of all four scales.

This method of characterizing daily events was abandoned for two reasons. First, characterizing the bipolar scales presented a problem. At first we thought we could do this with positive numbers representing one half of the bipolar scale and negative numbers representing the remaining half. But this was not satisfactory because it implied a certain "psychological" valence for each of the poles of the bipolar scales, making assumptions which we felt we could not make. Second, the metric emerging from the multiplicative combinations was not satisfactory. Having a high score on one or more scales would yield an extremely high product with an unacceptable range, for example, several million. There would also be difficulties in interpreting the metric. The kind of statements we would be able to make with the product score would be along the lines of "if a subject receives a score of 2,400,000 on a given day, then the probability of an illness is such and such." We felt that such a statement conveyed little information about what actually went on during that day for that subject. For example, a high score could be due to one event with extreme ratings on it or to several events with lower ratings. Furthermore, we would not know which of the rating dimensions contributed the high scores.

The scheme that we developed to characterize daily event information used the event rating information as well as the frequency of events during a day and yielded a readily interpretable score. On a dimension by dimension basis we first eliminated those events which we felt had relatively little psychological impact. Thus, when considering the desirability dimension, we eliminated events which were somewhat or slightly desirable and somewhat or slightly undesirable. Exactly the same procedure was followed for the change-stabilizing dimension. For meaningfulness, a unipolar dimension, we retained events which were scored moderately meaningful or greater. Our strategy varied on the control dimension since the effects of events

which are perceived as either under one's control or out of one's control are both of interest. No events were eliminated on the control dimension; instead, the 5-point rating dimension was dichotomized. Events which were scored as either being under complete control or as having quite a lot of control are considered "in control" events. The remaining scores (some control, slight control and no control) are considered in the "no control" category.

Once the cut points were applied and events eliminated, each day could be characterized as to the frequency of each kind of event, for example, as having five desirable events, three control events, two changing events, etc. The total number of events falling within each dimension is a direct function of the number of times the dimension was used. Thus, the changing-stabilizing dimension has relatively few events whereas the other dimensions have many more.

This strategy was taken one step further to include combinations of the rating dimensions. Events which were viewed as desirable and changing and meaningful were tabulated for a given day. The frequency of this three-way classification is lower than any single classification because there is a greater chance that an event would be eliminated on three dimensions rather than on a single dimension. For example, an event which was rated as desirable might not receive a high rating on meaningfulness and be eliminated on that basis. Because the change-stability dimension was not used very often, the four fold scheme using desirability, changingness, meaningfulness, and control does not yield many events. For this reason, we will be focusing primarily on the three fold scheme which includes the dimensions desirability/undesirablity, control, and meaningfulness. The four combinations are desirable-meaningful-in control events, desirable-meaningful-not in control events, undesirable-meaningful-in control events, and undesirable-meaningful-not in control events and their abbreviations are DMCo, DMNCo, UMCo, and UMNCo, respectively.

In the longitudinal analysis where we are trying to predict physical symptomatology, further alterations of the data set were necessary. Because some of the events concerned health related phenomena, for example, visits to physicians, these events had to be omitted from the analysis. The three events "illness or injury to yourself", "visit to a health care worker for bodily complaint", and "visit to a health care worker for psychological complaints"were eliminated from the event scores described above. Additionally, for the analysis presented here only actually occurring events, and not anticipations, were used.

When subjects are requested to report daily events, symptoms, and mood over long periods, there is bound to be a problem with missing data. Fortunately, we did not have many missing days. We truncated the number of days for some of our subjects so as to exclude the very end of the reporting period which may have had several missing days. With the 50 subjects we had 4,297 good days and 93 days with missing data. This is an average of roughly two percent missing data.

Although two percent is not very much missing data, if subjects were missing days in a non-random manner distortions could be introduced. In order to counteract this effect, we tried to replace the missing data in a way so as not to create artifactual results. For events, we treated the day as if there were no events reported at all. This procedure was chosen because the number of events reported per day was not very high and the inclusion of a few zero scores would not unduly bias means or standard deviations. For the mood data we replaced the missing data with the grand mean for that subject over the entire reporting period. We chose this method because the mood scale means were well above the zero mark and the inclusion of a few days with zero scores would markedly effect means and standard deviations. These procedures are unlikely to inflate our estimate of the causal impact of events. Because most of our analyses predict from events to symptoms and/or mood, treating missing days as if they had no events would tend to weaken any relationships between events and the outcome variables. If there were a relationship between mood and events, it would be weakened somewhat because on missing days zero events would not be associated with high or low mood, but with moderate (average) mood.

Concurrent Validation of Event Classifications With Daily Mood Scales

The scheme which we have used to characterize daily event information is not one which has been previously used in the literature. Although the scheme appears to be a sound, reasonable way to condense a tremendous amount of information, it was possible that for anyone of several reasons our method might be faulty. For example, perhaps our cutpoints were not high enough and the events included in the analyses really do not pack the punch which we assume they do. Before using the events to predict our main outcome variable, symptomatology, we felt we should have some confirmation that the event characterization was reasonable.

Several studies, including one using our set of events, have shown that daily mood is related to the number of pleasant/desirable and unpleasant/undesirable events reported on the same day (Lewinsohn & Graf, 1973; Lewinsohn & Libet, 1971; Rehm, 1978; Stone, in press). The relationships observed have varied considerably in their magnitudes with smaller relationships being observed when more complex mood assessments, such as our checklist, are used (Stone, in press).

We examined same day event-mood relationships with one half of the entire sample (the rationale for the sampling procedure and the method are presented later). A series of multiple regressions was computed using sets of event classifications similtaneously allowing us to predict, for example, from desirable and undesirable events together. The criteria used were the most readily interpretable mood factors, positive engagement and negative engagement. Certainly the relationships between desirable and undesirable events and the mood factors are intuitively predictable, while the relationships between the change-stabilizing dimension and control dimension are not as clear. Thus, we also expected to learn something about the dimensional

ratings with this analysis.

The number of desirable and undesirable events predicted 30 percent of the variance of positive mood with desirable events having a much larger effect than undesirable ones (betas of .52 and -.15, respectively; both $p<.01$). The beta weights indicate that the associations were also in the expected directions. With negative mood, only seven percent of the variance was accounted for, yet the directionality of the association was also as expected (betas of -.19 and .19 for desirable and undesirable events; $p<.01$). Changing and stabilizing events predicted 14 percent of positive mood's variation with stabilizing events having the only significant effect (beta of .38, $p<.01$) and six percent of negative mood's variation with both types of events having an effect (betas of .14 and -.20 for changing and stabilizing events; $p<.01$).

Unlike the previous two analyses which were overlapping because they were unidimensional analyses, the next set of analyses jointly took into account desirability, meaningfulness, and control. Thirty-four percent of positive mood's variation was predicted by DMCo, DMNCo, UMCo, and UMNCo. Both desirable events had a large contribution (betas of .44 and .31 for DMCo and DMNCo; $p<.01$) while only UMNCo made a significant inverse contribution (beta of -.09, $p<.01$). Only seven percent of negative mood was predictable. Interestingly, DMNCo and UMNCo had the only significant contributions and were of approximately equal magnitude (betas of -.19 and .17, respectively; $p<.01$).

Finally, the classification which uses all of the event rating dimensions predicts less variance for positive mood, 19 percent, than did the previous analysis. They are of interest nonetheless because the change dimension is used. DCMCo and DCMNCo both have positive betas, .12 and .11, as do DSMCo and DSMNCo, .27 and .26, all of which are significant at the .01 level. Only UCMNCo has a significant negative relationship with positive mood (beta of -.09, $p<.01$). Eight percent of negative mood's variance was predictable from this event classification. UCMNCo and UCMCo both had significant direct relationships (betas of .16 and .06, respectively; $p<.01$ and $p<.05$), while DSMNCo and DSMCo both were inversely related to negative mood (betas of -.17 and -.09, respectively; $p<.01$).

In general, then, positive mood was considerably more predictable than was negative mood. The relationships of desirable and undesirable events with positive and negative mood were consistent with previous studies. With the change/stability dimension, only stability predicted positive mood (directly), while both change and stability predicted negative mood (change directly; stability inversely). From the analyses of three dimensions together, we observed that desirable, meaningful events predicted positive mood regardless of their control status, yet only undesirable, meaningful events which were out of the subjects' control indirectly predicted positive mood. With negative mood, only the out of control event combinations predicted with the directions in accordance to their desirability status. From the analysis of the four dimensions together we found that changingness did

not counter the effects of desirability: the only significant relationships with either positive or negative mood were event combinations with undesirability and changingness or event combinations with desirability and stability.

Overall, the classification appears reasonable in view of this concurrent mood analysis. Perhaps somewhat disappointing were the results of the four dimensional breakdown which predicted positive mood considerably less well than the three dimensional analysis, a result which could be related to the relatively low frequency of some of the classifications. In summary, though, the classifications seem satisfactory.

Analytic Strategy for the Aggregated Causal Analysis

In this report we present an analysis of event-symptom associations collapsed over individuals. This is not the optimal means of analyzing a data set such as this where individual differences are likely to exist, but an aggregated analysis over individuals is the first step toward an individual analysis. The analysis presented below does however, offer some advantages over an individual differences approach. If there are very strong effects in the data, they will likely show themselves quite clearly given the large number of observations associated with such group analyses. Related to this is that the results are usually simplier, if less interesting, to interpret. On the other hand, group analyses have the ever present problem of missing those groups of individuals who respond in particular, but different, ways and whose data, when averaged, reveal nothing. This is an expecially worrisome problem when there are person variables, such as a personality styles, which may moderate the effects the environment has on an individual. We are currently undertaking these individual differences analyses; hence, this analysis, and the report as a whole, should be regarded as preliminary.

We decided upon a test-replication strategy for this analysis given the large number of statistical tests we wished to perform on the data set. Certainly, it is more desirable to have a few "crucial" tests which would definitively probe the hypotheses. But as we indicated earlier the current uncertainty as to what "stressful" events are and the large number of ways of characterizing events force us to employ a large number of tests of whether or not daily experiences affect symptomatology. It would defeat the purpose of this investigation to limit ourselves to a few "best guesses" since we really have very little information to base the guesses on.

By using a test-replication procedure, we hoped to avoid high alpha rates. The sample was randomly divided in half, one half labeled the "test sample" and the other half labeled the "replication sample." The test sample was used to explore the entire range of event-mood-symptom characterizations and inter-relationships. The replication sample provides a means for replicating significant findings.

There were several major points which guided the analysis. The

temporal sequence of events and symptoms was one of them. If factor and outcome occurred on the same day, our predictions would be difficult to interpret, since it would not be clear whether the event or symptom occurred earlier in the day. For this reason, our analyses are of data where prediction is from events to symptoms on later days. But what should our causal period be? We could have predicted to symptoms on the day following an event (a one day lag), then to symptoms two days after an event, etc. Theoretically, however, we did not expect an event to have an effect on any particular day, but rather for some number of days following its occurrence. Furthermore, examining each day subsequent to an event would multiply the total number of analyses performed by the number of lagged days we examined. Thus, the procedure we adopted was to predict an occurrence of a symptom or episode which occurred within five days following event occurrence.

Another point was that each reporting day could have from zero to several events of a particular type. Since it seemed reasonable to assume that two desirable events would make the day more desirable than one desirable event (remembering that the events have already been screened for having "moderately" or greater dimensional ratings) and that three events would make it more desirable than two or fewer events, we decided to add information pertaining to the number of events to our analysis. We hypothesized that with a greater number of events of a particular type present on a given day, the effect on the outcome should become stronger. An exception to this expectation is when there are so few events or symptoms so as to make the finding unreliable, as occurs with four-way classifications of events.

The specific methods we used to define predictors and outcomes were designed to avoid the problems of autocorrelations in time-series data. In subsequent analyses autocorrelations will be addressed more directly, but, again, this is a preliminary report and detailed analyses are not presented here. The simplest way to avoid autocorrelation would have been to use only one six day group per subject, but that is self-defeating since only a small percentage of the data would be included in the analysis. If we left a few days between such groups, we felt that the autocorrelation problem would be reduced considerably; ten target days, for example, would be separated by well over a week. Days 10, 20, 30, and so on through 80 were chosen as target days and days 11-15, 21-25, and so on were used to define symptom and episode presence. Thus, these predictor-outcome groups were made up of periods of six days. This method seemed reasonable in that each subject contributed several predictor-outcome periods to the analysis, yet these pairs were separated in time.

An additional issue concerned coding episodes. What were we to do with events which occurred after an episode had already begun, yet had not yet ended? Because we were interested only in contributions which events made to episode onset, we created a variable with just that information: it was coded as present only on days when episodes started.

The event data which we used for the analyses included all of the 19 different ways of characterizing events that were described earlier. Furthermore, four different cutpoints were used to define event presence. They were: one or more of the particular types of events; two or more events; three or more events; and, four or more events. The outcome was defined as present if one or more symptoms or episode starts were found in the five day period following an event.

Table 16 is a comparison of the test and replication samples. We have actually broken down the samples further for specific analysis described later, but for now we consider the complete samples (see columns "3 and 6") with N's of 192 and 194 for the six day periods. The number of 6 day periods with a symptom is almost identical for both groups, 41 versus 40. Looking over the event information on the target day, the frequency of desirable events is comparable; however, there are many fewer undesirable events found in the test sample compared with the replication sample, 28 versus 36 percent. Conversely, the test sample has more stabilizing events and in control events. But in the higher order event combinations, some of these difference are reduced in magnitude, for example, with the positive events, although the differences in the negative events remain.

There were several statistical techniques available for testing event-outcome relationships including various time-series and Markov chain techniques. One method which we chose is based on the epidemiological statistic called relative risk. For interpretation, the relative risk seems superior to the other techniques, which yield estimates of variance explained, because it results in statements of the relative probability of having an outcome (symptom) in the presence of the factor (particular event type). An event type with a relative risk of 2.5 with symptoms as the outcome means that the conditional probability of having the outcome given the factor is two and one-half times greater than the conditional probability of having the outcome given no factor. Conversely, a fractional relative risk means the outcome occurs less often in the presence of the factor compared to its rate of occurrence given the absence of the factor. The expected value of the relative risk when the factor has no relationship to the outcome is 1.0.

The other method we chose is more typical in the sense that it is parametric. Specifically, we classified symptoms and episode starts according to day on which the symptom occurred (second through sixth day of the period) and compared the number of events occurring on days prior to the symptom day with the number of symptoms occurring on nonsymptomatic days. This method actually uses more event data than the relative risk analysis because it looks at events not only on the target day, but depending on when the symptom occurred, it also looks at events on several other days in the six day period.

One final note about the analysis. Typically, data going into these types of analyses have each subject coded once in terms of their status on the factor and outcome and the N for the statistic equals the number of subjects. With our longitudinal data, it is possible to

Table 16

Comparison of the Test and Replication Samples

	Test			Replication		
	1	2	3	4	5	6
Total number of six day groups	155	176	192	156	170	194
Number of six day groups with a symptom on any of days 2 through 6	39	41	41	39	40	40
Number of six day groups with an episode start on any of days 2 through 6	11	11	11	10	10	10
Percent of Target days with at least one event						
Desirable	83	83	83	83	84	82
Undesirable	25	28	28	37	35	36
Changing	25	26	28	33	33	36
Stabilizing	53	51	49	38	40	37
Meaningful	76	76	77	81	82	81
Control	81	81	82	72	72	66
Not Control	81	82	80	87	87	88
DMCo	57	55	57	54	55	52
DMNCo	45	45	44	54	55	57
UMCo	02	02	02	02	02	02
UMNCo	10	12	11	19	18	18
DCMCo	12	12	14	14	15	15
DCMNCo	05	06	07	08	09	08
UCMCo	01	01	01	01	01	01
UCMNCo	05	07	07	09	08	08
DSMCo	39	37	36	25	28	23
DSMNCo	28	27	25	23	23	22
USMCo	00	00	00	00	00	00
USMNCo	00	00	00	00	00	00

Note. Columns 1 & 4 are the data sets which exclude individuals with "one big episode" and groups of six days which were part on an episode, but not an episode start, on the target day. Columns 2 & 5 exclude individuals with "one big episode." Columns 3 & 6 are the complete data sets (used for mood analyses).

have, for example, a subject classified eight times, once for the factor and outcome for each ten day block of the 90 day reporting period.

Analysis of the Test Sample

Relative Risk Analysis

The significance levels of the four fold tables formed by the dichotomous factor and outcome were tested with Chi Square or Fisher's exact test depending on the smallest expected value in the table. Relative risks were computed from the conditional probabilities whenever the test was significant at the .05 level or less. In interpreting the level of significance and the relative risk, it should be remembered that significance is a function of both the underlying relationship among the variables as well as the distribution of the marginal totals. The greatest degree of statistical power in such tests is achieved when both row marginals and both column marginals are equal. As the distribution of either the column or row marginals varies from 50 percent, the statistical power of the test is reduced. Because less than a third of the predictor-outcome pairs had the outcome present, we know that the statistical power of the test is already reduced. The proportion of days which had an event depended upon the event class being examined and also upon the cut level. Clearly, as the cut becomes more stringent (for example, requiring that 4 or more events be there) the proportion of days with the event is reduced dramatically. When the proportion of days with the factor present is very low the conditional probabilities for the occurrence of a symptom with the factor present or not present might be highly discrepant, yet the chi square test or Fisher's exact test will not be significant.

We first examined the effect on symptoms of events classified on each of the dimensions separately. This analysis was performed using 176 six day periods from 23 targets (two subjects in the test sample were one big episode resonders and were removed; the remaining three are in the replication sample). Results are presented in Table 17. Moving from left to right across the table, we first find the relative risk of days with zero desirable events compared to days with 1 or more events in the first column, in the second column the risk for zero events compared to days with 2 or more events and so on. Although the relative risks differ from the expected value of 1.00, none of them are reliable at the .05 level of significance with a chi-square test so we conclude that there is no relationship between desirable events and symptoms. Likewise, none of the relative risks for undesirable events were significant. From here on we will only discuss relative risks significant at the .05 level or better so that we do not have to report every significance level. There were no significant relative risks for the change/stability dimension. Meaningful events produced significant relative risks of .46 and .28 when there were 3 or more and 4 or more events on the target day, respectively. The control classification did not result in any significant relative risks.

Table 17

Test Sample

Relative Risks Comparing the Probability of a Symptom or an Episode Start on Days with No Events to Days with One or More Events (N = 176, Subjects = 23)

Event Classification	Relative Risks			
	Number of Events			
	1 or more	2 or more	3 or more	4 or more
Desirable	1.23	1.15	.96	.48
Undesirable	1.04	1.12	.00	.00
Changing	.92	.44	.00	.00
Stabilizing	.66	.56	.25	.25
Meaningful	.78	.71	.46*	.28*
Control	.74	.63	.61	.69
No Control	1.53	1.60	1.70	1.24
DMCo	.47**	.31**	.23**	.00*
DMNCo	1.15	.87	.59	.26
UMCo	.00	.--	.--	.--
UMNCo	.66	.00	.00	.00
DCMCo	.69	.86	.00	.--
DCMNCo	1.08	1.80	.--	.--
UCMCo	.00	.--	.--	.--
UCMNCo	.28	.00	.00	.00
DSMCo	.28***	.20**	.38	.00
DSMNCo	1.07	.61	.28	.00*
USMCo	.--	.--	.--	.--
USMNCo	.--	.--	.--	.--

Note. D= Desirable, U= Undesirable, C= Changing, S= Stabilizing, M= Meaningful, Co= Control, NCo= No Control.
.-- means that there were no events available for the relative risk computation.
* $P<.05$ ** $P<.01$ ***$P<.001$

Of the three way classifications, only events which were desirable, meaningful, and in control produced reliable relative risks. These statistics were .47 with 1 or more, .31 with 2 or more, .23 with 3 or more, and .00 with 4 or more of these events. Undesirable, meaningful, in control events were not tested for 2 or more events and above because there were not any of these types of events recorded on the target days. The four way classification fairly well duplicated the one-way and three-way analyses; desirable, stabilizing, meaningful, in control events at the 1 or more and the 2 or more level were significant. Also, desirable, stabilizing, meaningful, not in control events are significant at the 4 or more level.

We now modify the data set somewhat because the previous analysis was too conservative in the way episodes were recorded. If an episode was recorded, then individual symptoms were not recorded on any of those days. The bias occurs when an episode began before one of the six day periods started, say starting on day 18 when the six day period began on day 20. When this happened, we could not predict symptoms at all because we attributed them to the episode and we are only predicting episode starts, not ongoing episodic days. Thus, in these cases there was no opportunity to predict symptoms even if a relationship truely existed between events and symptoms.

The following relative risks were computed eliminating 21 six day periods in which an episode preceded the period. Note that the N drops from 176 in the previous analysis to 155 in this analysis (see Table 18). All levels of stabilizing events results now produce significant relative risks. There is also one significant risk for in control events and two for meaningfulness. *DMCo* and *DSMCo* results were quite similar to those produced in the previous analysis. A major difference, though, is that in this analysis the DSMNCo events are significant at three of the four levels. Overall, eliminating the 21 six day groups which were part of an episode considerably strengthened the results.

Parametric Analysis

This analysis differs from the relative risk analysis in that more event data is used and the statistical testing is parametric rather than nonparametric. We first took the same six day target periods that had been used in the relative risk analysis and divided them into periods with and without symptoms. Previously we had examined whether an event on the target day was related to the onset of symptoms in the next five days. This time we analyzed the presence of events for each of the 5 days (following the target day) on which a symptom might have first appeared. Looking at the intersection of the first row and column of Table 19 we see that on the first day following the target day (T+1) when a symptom occurred it had been preceded by an average of 2.09 desirable events. When a symptom did not occur on T+1, the target days had 3.43 desirable events. Analogously, the second column, first row, represents the data for symptoms which occurred on day T+2. Desirable events preceded symptom days with an average of 1.93 and nonsymptom days with an average of 3.29. All target days are

Table 18

Test Sample

Relative Risks Comparing the Probability of a Symptom or an Episode on Days with No Events to Days with One or More Events Eliminating Six Day Periods That Were Part of an Episode (N = 155, Subjects = 23)

Event Classification	Relative Risks			
	Number of Events			
	1 or more	2 or more	3 or more	4 or more
Desirable	1.15	1.07	.84	.45
Undesirable	1.18	1.25	.00	.00
Changing	1.06	.61	.00	.00
Stabilizing	.60*	.54*	.25*	.23**
Meaningful	.82	.77	.49*	.30**
Control	.67	.55*	.54	.62
No Control	1.57	1.68	1.68	1.21
DMCo	.47**	.31***	.22**	.00**
DMNCo	1.16	.79	.59	.25
UMCo	.00	.--	.--	.--
UMNCo	.81	.00	.00	.00
DCMCo	.71	.71	.--	.--
DCMNCo	1.25	1.67	.--	.--
UCMCo	.00	.--	.--	.--
UCMNCo	.40	.00	.00	.00
DSMCo	.27***	.20**	.34	.00
DSMNCo	.88	.31*	.00*	.00*
USMCo	.--	.--	.--	.--
USMNCo	.--	.--	.--	.--

Note. D= Desirable, U= Undesirable, C= Changing, S= Stabilizing, M= Meaningful, Co= Control, NCo= No Control.
.-- means that there were no events available for the relative risk computation.
* P<.05 **P<.01 ***P<.001

Table 19

Test Sample

Mean Number of Events Computed Using Days
Which Occurred Prior to the Day with a Symptom or Episode Start
Compared to Days Without Symptoms

Event Classification	Days on Which Symptoms Occurred				
	T+1	T+2	T+3	T+4	T+5
Desirable					
Symptoms	2.09**	1.93	1.81	1.70	2.67
No Symptoms	3.43	3.29	3.26	3.38	3.38
Undesirable					
Symptoms	.36	.43	.43	.40	.33
No Symptoms	.36	.39	.44	.49	.44
Changing					
Symptoms	.30*	.37	.48	.20	.33
No Symptoms	.40	.39	.43	.30	.38
Stabilizing					
Symptoms	.74**	.90	.67	.30	1.30
No Symptoms	2.00	1.90	1.90	2.10	2.00
Meaningful					
Symptoms	1.60**	1.80*	1.80	1.40	2.30
No Symptoms	3.30	3.30	3.20	3.30	3.40
Control					
Symptoms	1.70	1.80	2.00**	1.20*	1.70
No Symptoms	2.30	2.30	2.30	2.50	2.50
Not Control					
Symptoms	2.50	2.40	2.40	2.10*	2.30
No Symptoms	2.70	2.70	2.70	2.80	2.80
DMCo					
Symptoms	.57***	.83	.81	.60	1.30
No Symptoms	1.40	1.30	1.20	1.40	1.30
DMNCo					
Symptoms	.81	.80	.57	.60	1.00
No Symptoms	1.40	1.50	1.60	1.50	1.60
UMCo					
Symptoms	.00	.33	.00	.00	.00
No Symptoms	.03	.37	.01	.01	.04
UMNCo					
Symptoms	.09	.07	.24	.18	.16
No Symptoms	.18	.20	.24	.18	.16

DSMCo					
Symptoms	.21***	.37	.19	.20	.67
No Symptoms	.78	.64	.56	.77	.68
DSMNCo					
Symptoms	.40	.47	.38	.10	.67
No Symptoms	1.04	1.10	1.14	1.09	1.16
DCMCo					
Symptoms	.11	.10	.24	.10	.00
No Symptoms	.15	.13	.12	.83	.16
DCMNCo					
Symptoms	.85	.10	.48	.00	.00
No Symptoms	.56	.37	.74	.03	.46
UCMCo					
Symptoms	.00	.00	.00	.00	.00
No Symptoms	.00	.00	.00	.00	.00
UCMNCo					
Symptoms	.21	.00	.14	.10	.00
No Symptoms	.11	.13	.14	.65	.10
USMCo & USMNCo					
Symptoms	.00	.00	.00	.00	.00
No Symptoms	.00	.00	.00	.00	.00

Note. For symptomatic days, the Ns are for the Target day through Target +4, 17,9, 11, 7, and 3, respectively. For nonsymptomatic days, the N is 108.
* P<.05 **P<.01 ***P<.001

represented in this analysis since there are no symptoms on target days (they were removed). Since in some of the six day periods symptoms or episode starts were on day 2, the N is lower than for the target days. The row labeled No Symptoms represent all days without symptoms classified according to their relationship to the target day. Differences in the means were tested with F -tests. Significant differences are interpreted as meaning that days prior to symptoms have relatively more or less events compared to days which are not followed by symptoms. For example, the means mentioned above, 2.09 and 3.43, were significant at the .01 level.

The data presented in Table 19 support the results of the relative risk analysis. Stabilizing, meaningful, DMCo and DSMCo events are all significant. However, this analysis extends the results by showing that there are fewer desirable events and fewer in control events preceding symptoms. There is also a suggestion of more out of control events preceding symptoms.

Analysis of the Replication Sample

Relative Risk Analysis

The analysis was performed using 170 six day periods from 22 subjects (three subjects had one big episode and were removed). The pattern of relative risks for the replication sample (see Table 20) differs considerably from the pattern observed with the test sample. Desirable events do not produce significant relative risks, but undesirable events do increase symptom risk given the two significant statistics for 1 or more and 2 or more events. Changing events do not produce significant risks and the decreasing risk effect of stability events found with the test sample is no longer observed. The meaningfulness effect is also lost with the replication sample. Out of control events do not produce significant relative risks, but a significant increase in risk is found for in control events at the 4 or more level.

In the test sample, DMCo events strongly reduced symptoms and DMNCo events reduced them, but less stongly. The relative risks in the replication sample are significant and in the opposite direction for DMCo at the one or more level. A significant increase in relative risk for one or more UMNCo was found in the replication, but not in the test sample.

The four dimensional event classifications of the replication were also inconsistent with the test sample results. Whereas DSMCo had a major protective effect in the test sample, there were no significant relative risks in the replication group. Also, DCMCo at the three or more cutpoint produced a significant increase in risk for symptoms.

Following the same strategy here as with the test sample, we eliminated six day blocks which had an ongoing episode and were, therefore, not capable of being predicted (see Table 21). Rather than strengthening the results of the previous analysis as was the case with

Table 20

Replication Sample

Relative Risks Comparing the Probability of a Symptom or an Episode Start on Days with No Events to Days with One or More Events (N = 170, Subjects = 22)

Event Classification	Relative Risks			
	Number of Events			
	1 or more	2 or more	3 or more	4 or more
Desirable	2.12	2.02	2.06	2.22
Undesirable	1.76*	2.10*	.88	.00
Changing	.66	.83	1.16	1.54
Stabilizing	.95	1.06	1.26	1.33
Meaningful	1.10	1.25	1.28	1.29
Control	1.75	1.74	1.70	2.03*
No Control	1.67	1.78	1.88	1.99
DMCo	1.67*	1.71	1.72	1.94
DMNCo	1.28	1.38	1.50	1.33
UMCo	1.16	.--	.--	.--
UMNCo	1.79*	1.59	.00	.--
DCMCo	.63	1.45	3.27*	3.27
DCMNCo	1.17	.00	.--	.--
UCMCo	.00	.--	.--	.--
UCMNCo	.77	.00	.--	.--
DSMCo	1.48	1.26	1.38	1.17
DSMNCo	1.34	1.58	1.70	.75
USMCo	.--	.--	.--	.--
USMNCo	.00	.--	.--	.--

Note. D= Desirable, U= Undesirable, C= Changing, S= Stabilizing, M= Meaningful, Co= Control, NCo= No Control.
.-- means that there were no events available for the relative risk computation.
* $P < .05$

Table 21

Replication Sample

Relative Risks Comparing the Probability of a Symptom or an Episode on Days with No Events to Days with One or More Events (N = 155, Subjects = 22)

Event Classification	Relative Risks			
	Number of Events			
	1 or more	2 or more	3 or more	4 or more
Desirable	1.71	1.71	1.71	1.95
Undesirable	1.48	1.78	.89	.00
Changing	.75	.87	1.30	1.73
Stabilizing	.91	1.02	1.14	1.28
Meaningful	1.12	1.26	1.27	1.29
Control	1.37	1.49	1.51	1.73
No Control	1.37	1.43	1.38	1.48
DMCo	1.47	1.67	1.89	2.10*
DMNCo	1.19	1.23	1.39	1.47
UMCo	1.27	.--	.--	.--
UMNCo	1.53	1.67	.00	.--
DCMCo	.84	1.64	3.69*	3.69
DCMNCo	1.18	.00	.--	.--
UCMCo	.00	.--	.--	.--
UCMNCo	.80	.00	.--	.--
DSMCo	1.38	1.21	1.48	1.18
DSMNCo	1.21	1.25	1.80	.79
USMCo	.--	.--	.--	.--
USMNCo	.00	.--	.--	.--

Note. D= Desirable, U= Undesirable, C= Changing, S= Stabilizing, M= Meaningful, Co= Control, NCo= No Control.
.-- means that there were no events available for the relative risk computation.
* $P < .05$

the test sample, the procedure weakened the effects. Only weak DMCo and DCMCo effects remained; in both instances these events increased the risk for symptoms.

Parametric Analysis

Unlike the test sample, the results of the parametric analysis varied somewhat from the relative risk analysis in the replication sample. These results are presented in Table 22. An effect of meaningfulness, in the same direction as desirable events, was found in this analysis. The DMCo effect did replicate across the two analyses. Finally, the DCMCo did not replicate, but there was an effect of UCMNCo; more events with symptoms, which was not observed in the relative risk analysis.

Implications of Relative Risk and Parametric Analyses and Additional Analyses

In the test sample both the risk analysis and the parametric analysis strongly suggest that experiencing desirable and/or stabilizing events reduces the likelihood of a symptom by a factor of from 1/2 to 1/5 as compared to the rate of days when such events are not experienced. But in the replication sample the results are generally much weaker than those of the test sample in terms of effects being consistent within analyses (at various levels of events) and across analyses (relative risk vs. parametric and effects of the removal of six day groups which were part of an episode). Nonetheless, the few significant results in the replication sample indicated effects opposite in direction to those observed in the test sample.

These are somewhat puzzling results. Perhaps the most striking impression one has is from a comparison of the relative risk tables. Ignoring for a moment significance levels, most of the risks for the test sample are below 1.0 indicating that events are associated with fewer subsequent symptoms (all significant risks are), while most of the risks in the replication sample are above 1.0 (all significant risks are). What causes this pattern? From our earlier comparison of the samples' symptom and event frequencies (Table 16) we know that the number of days with a symptom and episode start are almost identical, so it is not a preponderance of symptoms in one of the samples that is causing the pattern. However, the number of events reported by each group is not equal. Compared to the test sample, the replication sample had 50 percent more target days which had undesirable events and 88 percent more with UMNCos. Although the number of days with desirable events was comparable, there were 39 percent more days with stabilizing events and 56 percent more days with DMCos in the test sample. Overall, on the target days the test sample experienced more desirable and stabilizing events while the replication sample had more undesirable events.

Another possible explanation for the suprising pattern of relative risks is the relationshp of occurrence among different types of events. It is possible that event occurrences are related in a way such that

Table 22

Replication Sample

Mean Number of Events Computed Using Days
Which Occurred Prior to the Day with a Symptom or Episode Start
Compared to Days Without Symptoms

Event Classification	Days on Which Symptoms Occurred T+1	T+2	T+3	T+4	T+5
Desirable					
Symptoms	3.48	2.85	2.60	2.93	3.57
No Symptoms	2.75	2.52	2.47	2.43	3.55
Undesirable					
Symptoms	.69	.56	.92	.53	.57
No Symptoms	.47	.59	.61	.42	.56
Changing					
Symptoms	.50	.68	.92	.60	.57
No Symptoms	.58	.64	.58	.50	.52
Stabilizing					
Symptoms	1.38	1.18	.92	.87	.71
No Symptoms	1.03	1.03	1.00	.98	1.15
Meaningful					
Symptoms	3.71	3.15	3.32	3.53	4.00
No Symptoms	2.64*	2.76	2.52	2.47	2.63
Control					
Symptoms	2.63	2.29	1.96	1.33	1.57
No Symptoms	1.78	1.90	1.92	1.88	1.93
Not Control					
Symptoms	3.17	2.91	3.08	3.07	2.86
No Symptoms	2.86	2.91	2.66	2.40	2.63
DMCo					
Symptoms	1.67	1.29	1.44	1.00	1.29
No Symptoms	1.04*	1.07	1.09	1.14	1.19
DMNCo					
Symptoms	1.44	1.26	1.00	1.60	2.14
No Symptoms	1.15	1.03	.93	.88	.87
UMCo					
Symptoms	.02	.00	.40	.07	.14
No Symptoms	.02	.05	.47	.04	.03
UMNCo					
Symptoms	.31	.35	.48	.40	.29
No Symptoms	.21	.34	.25	.18	.33

DSMCo					
Symptoms	.73	.71	.64	.47	.29
No Symptoms	.45	.40	.48	.50	.61
DSMNCo					
Symptoms	.58	.38	.20	.40	.43
No Symptoms	.42	.48	.43	.40	.43
DCMCo					
Symptoms	.25	.18	.16	.00	.00
No Symptoms	.21	.15	.19	.16	.13
DCMNCo					
Symptoms	.10	.15	.20	.27	.29
No Symptoms	.09	.14	.09	.09	.03
UCMCo					
Symptoms	.00	.00	.00	.07	.00
No Symptoms	.01	.00	.33	.02	.02
UCMNCo					
Symptoms	.06	.15	.40	.27	.14
No Symptoms	.13	.15	.12*	.08	.19
USMCo					
Symptoms	.00	.00	.00	.00	.00
No Symptoms	.00	.02	.00	.00	.00

* $P < .05$

when desirable events occur, so do undesirable events. This could lead to unexpected relationships between desirable events and outcomes if the concurrent undesirable events affected the outcome. To take this one step further, if in one sample desirable events regularly occurred with undesirable events and this was not the case in the other sample, different patterns of relative risks could be expected in the samples. Since the pattern of results in our two samples were different, we explored this possibility by examining the intercorrelations of our event categories for the test and replication samples. We were interested in whether or not one type of event was related to occurrences of another type of event on the same day and not in the correlation of the number of events which occurred, so all event variables were dichotomized such that zero equaled no events and one equaled one or more events occurring on a day. Table 23 presents these correlations and, to make differences in the Table apparent, Table 24 presents differences between test and replication correlations.

Occurrences of changing and stabilizing events are more strongly related to desirable event occurrence in the test sample than in the replication; conversely, undesirable events are more strongly related to desirable events in the replication sample than in the test sample. In the test sample changing events are more strongly related to stabilizing, control, and not control events; stabilizing events are more strongly related to meaningful and control events; and, meaningful events are very much more related to control events. With three dimensions, DMCo and UMNCO are not related in the test sample, yet are related in the replication sample.

To summarize these results, there are different patterns in conjoint event occurrence indicating that analyses of single classes of event occurrence may be misleading because one class of events is related to another class of events. This suggests that we should explore the effects of predicting from two or more types of events jointly.

Actually, we already know that combining different event categories improve at least one type of prediction, concurrent mood. In the section on concurrent validation of the event classifications, we found that simultaneously regressing more than one event class on mood significantly added to the multiple correlation. This means that prediction was improved over using a single event classification.

In the next analysis we explored the posssibility that the joint prediction might clarify or otherwise improve prediction by combining two types of event occurrence to predict symptoms or episode starts using the relative risk paradigm. First, to achieve reasonable cell frequencies for estimating relative risks, desirable events were trichotomized and undesirable events were dichotomized. Relative risks were computed for each of the six cells formed by crossing desirable and undesirable events. This was done for both the test and replication samples. (See Table 25.) As expected, there was a smaller N in the test sample than in the replication sample with one or more undesirable events, 38 versus 57. There is only a single significant

Table 23

Correlation of Events to Events (Dichotomized Data)
Test Sample Data Below the Diagonal
Replication Sample Data Above the Diagonal

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. Desirable	*	-3	9	26	46	31	9	46	46	6	6	17	13	3	0	24	23	0	5
2. Undesirable	7	*	20	13	17	12	27	18	-1	18	64	-5	1	11	41	14	5	0	15
3. Changing	20	12	*	0	25	8	-10	16	2	10	28	58	43	11	45	6	-17	0	4
4. Stabilizing	45	7	13	*	26	15	12	27	27	-2	7	-3	-20	10	12	73	69	0	14
5. Meaning	60	12	27	42	*	13	1	50	50	6	23	19	14	4	14	27	25	0	5
6. Control	57	14	22	34	63	*	-12	66	-6	8	7	20	-14	5	9	35	-2	0	7
7. Not Control	-8	22	1	-9	-11	-15	*	-11	39	5	18	-27	11	3	11	2	20	0	4
8. DMCo	49	-10	18	44	63	53	-23	*	15	3	15	33	-6	-9	6	53	10	0	10
9. DMNCo	38	1	7	32	49	27	41	19	*	3	5	3	28	7	-8	20	50	0	-13
10. UMCo	6	25	14	4	8	6	6	2	6	*	5	8	13	57	12	-8	3	0	-2
11. UMNCo	2	59	20	10	18	10	15	3	7	41	*	3	8	16	64	9	-4	0	23
12. DCMCo	15	-17	63	-3	19	16	-17	31	3	-5	-13	*	7	-3	13	2	-10	0	12
13. DCMNCo	10	-7	41	10	13	11	11	2	25	-3	-8	10	*	-2	-2	-13	-17	0	-4
14. UCMCo	5	20	20	11	6	5	5	10	1	81	34	-4	-3	*	26	-5	15	0	-1
15. UCMNCo	1	41	41	16	13	11	11	8	-4	39	69	-9	-6	49	*	13	-7	0	16
16. DSMCo	34	-4	8	76	44	37	-18	70	21	8	7	3	5	14	17	*	42	0	-7
17. DSMNCo	26	4	7	58	33	16	28	24	68	2	12	-5	18	6	5	38	*	0	-6
18. USMCo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	0
19. USMNCo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*

Note. Decimal points have been omitted.

Table 24

Differences Between Correlations Among Events
For the Test and Replication Samples

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. Desirable	*																		
2. Undesirable	10	*																	
3. Changing	11	-8	*																
4. Stabilizing	19	-6	13	*															
5. Meaning	14	-5	2	16	*														
6. Control	26	2	14	19	50	*													
7. Not Control	-17	-5	11	-21	-12	-3	*												
8. DMCo	3	-28	2	17	13	-13	-12	*											
9. DMNCo	-8	2	5	5	-1	33	2	4	*										
10. UMCo	0	7	4	6	2	-2	1	-1	3	*									
11. UMNCo	-4	-5	-8	3	-5	3	-3	-12	2	36	*								
12. DCMCo	-2	-12	5	0	0	-4	10	-2	0	-13	-16	*							
13. DCMNCo	-3	-8	-2	30	-1	25	0	8	-3	-16	-16	3	*						
14. UCMCo	2	9	9	1	2	0	2	19	-6	24	18	-1	-1	*					
15. UCMNCo	1	0	-4	4	-1	2	0	2	4	27	5	-22	-4	23	*				
16. DSMCo	10	-18	2	3	17	2	-20	17	1	16	-2	1	18	19	4	*			
17. DSMNCo	3	-1	24	11	8	18	8	14	18	-1	16	5	35	-9	12	-4	*		
18. USMCo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	
19. USMNCo	-5	-15	-4	-14	-5	-7	-4	-10	13	2	-23	-12	4	1	-16	7	6	0	*

Note. Decimal points have been omitted. Positive differences indicate that the test sample correlation was more positive than the replication sample correlation. Negative difference indicates that the replication sample was more positive.

Table 25

Relative Risks for Symptoms and Episode Starts
Predicted by Combinations of Desirable and Undesirable Events

		Number of Desirable Events		
		0,1	2,3, or 4	5 or more
Number of Undesirable Events				
0				
	Test	1.35 (37)	1.19 (53)	.21** (27)
	Replication	.77 (32)	.71 (42)	.93 (24)
More than 0				
	Test	.64 (10)	1.43 (22)	1.10 (6)
	Replication	1.16 (17)	1.15 (20)	1.78* (20)

Note. The samples used were those with an N of approximately 155. Cell N's are in paratheses.
* $P < .05$ ** $P < .01$

relative risk for each sample, and, although they are not found in the same cell, they nonetheless appear consistent with our a priori expectations. Reporting five or more desirable events in conjunction with no undesirable events leads to a risk of .21 in the test sample, while five or more desirable events and more than one undesirable events result in a risk of 1.78 in the replication sample. Although not identical, these results are not inconsistent with one another and support further joint analyses.

DISCUSSION

Subject Sampling and Response Rates

Our original goal was to obtain a sample of 90 community participants. We did have difficulty meeting this goal given the unexpectedly low rate of response to our letters of introduction and advertisements in local newspapers. In total, we interviewed and trained 79 couples in the use of the ADE. These couples's demographic characteristics were similar to those of the census tracts from which they were drawn; however, there is no doubt that they were a highly select group considering the manner in which they were selected.

Of the 79 couples interviewed, 13 dropped out of the study after completing none or only a few forms. Sixteen couples completed more than a few but less than 40 forms, which was the number of completed forms that would be adequate for our later analyses. Fifty couples completed 40 or more forms and averaged a completion rate of 85.9 forms. Generally, subjects in these three groups were demographically homogeneous. The only exception was with age; couples who terminated participation soon after the interview were older than those who completed more than 40 forms, and they were in turn older than the group who completed some forms. Although the group means on age vary by approximately ten years, the ordering of the three groups does not readily suggest an explanation for the effect.

Another notable aspect of response rate is the number of forms that were omitted during a couple's reporting period. Missing days were defined by marking the last day of responding (which may have been less than 90 days) and then locating missing forms between the start date and the termination date. The average number of missing forms in the 50 completed subjects was two percent. For a 90 day reporting period, this yields an average of less than two missing days per subject. We believe this rate is acceptable for a study such as this, especially in light of the amount of time subjects devoted to the study in total. The missing data could present analytic difficulties nonetheless, and a missing data replacement scheme was developed.

In sum, there were two sources of subject selection bias: the initial selection scheme which attracted a volunteer sample and the difficulty of the task which caused some people to terminate their participation prematurely. Better "packaging" of the goals of the study might improve initial response rates. Our impression was that the monetary compensation offered ($80.00) was not the motivating

factor with those who ultimately completed participation. Rather, it seemed to be their desire to help us learn about people. Therefore, we do not believe that increased subject payment would be useful in subsequent studies of this type.

We do feel that the procedures used in the early part of the recording period could significantly reduce attrition early in the study. Several telephone contacts in the first week of ADE reporting, to answer questions and provide feedback about the amount of time they are spending with forms, could prevent the discouragement which lead to the fairly high drop out rate early on in the study. It is particularly important to prevent early attrition since a large amount of time will have been spent in the initial interview training the subjects.

Event Reporting

A large number of events and anticipated events were reported by the 50 male completers - 24,743. The daily average was 5.26 for events and .46 for anticipations. The event statistic is identical to the results of a pilot study using 26 couples reporting for 14 days (Stone & Neale, in press). However, the number of anticipations reported here, .46/day, is just a third of those reported in the pilot study, 1.43/day. One possible explanation for this lower rate is that anticipations are reported at higher rates earlier on in the study, and, indeed, in our analysis of event reporting by thirds (using a N of 47) we found that there were 742 anticipations in the first 30 days, 610 in the second thirty days, and 491 in the final 30 days. Event reports also declined over the 90 day reporting period, but only from the first 30 days to the second thirty days (8126 versus 6847).

These results may be interpreted either as showing that events are over-reported during the first 30 days and then stabilize during the following 60 days or that reports are accurate in the first 30 days and events on the following 60 days are underreported. However, the fact that event reporting stabilizes after the first 30 day drop indicated that most of our event data are likely to be fairly accurate. On the other hand, the anticipation data appears to have a serious problem. Anticipation frequency declines in each of the three 30 day periods. Subjects may be tiring of that particular part of the task over the 90 days.

There were major individual differences in the total number of events reported by subjects. A nine fold difference was observed in the smallest versus the largest number of events reported; 116 versus 1194. The modal value was 400-499 events and the distribution was widely spread between 100-199 and 800-899; the highest subject was an outlier in the distribution. Although we did not examine these differences in subject reporting here, there are several interesting questions that we hope to follow up in subsequent reports. Are those subjects who have high totals reporting many more minor events (as assessed by dimensional ratings) than those with lower totals or are the qualities of the reported events equivalent? Are there demographic

and/or personality styles that are associated with event reporting?

As expected, event frequencies varied according to event content. "Close interaction with spouse" had the highest frequency, 2147, occurring on the average of once every other day. Six events had frequencies greater than 1000: "You are getting along well with children," "Hobbies, reading, letter writing," "Other family-related duties away from home," "General housework," "General contact with relatives," and "Children getting along well together or with peers." At the other extreme, the event "Fired, quit, resigned" was the least frequently reported event with only three occurrences. Several events had a frequency lower than 30: "Firing or disciplining at work by Target," "Promotion or raise," "Major selling," "Inheritance or windfall," "Death of friend, neighbor, or acquaintance," "Problems with friend, neighbor, or acquaintance," "Visit to health care worker for psychological complaint." These results are consistent with the results of studies of major life events in that event frequency is inversely related to event intensity or importance. Perhaps an important exception to this general statement is found in the family-oriented events. Quite frequent items, such as "Close interaction with spouse" and "You are getting along with children," obtained mean ratings of moderately on the meaningfulness rating scale. Intuitively, this makes sense: a person's family is typically viewed as a extremely significant life area. These data do not directly contradict the previous literature since the major life events studies do not include events such as close interaction, but only more discrete family-related events such as divorce.

A question which arose during the design of the study concerned whether there would be enough variation in the kinds of events we would observe. Although we studied 50 people for approximately three months, it was possible that nothing of major importance would happen. The event frequencies demonstrate that, somewhat to our surprise, quite a lot happened. Subjects reported 18 promotion or raises, 3 quit, fired, or resigned, 12 major sellings, 52 major buyings, 271 relatives sick or death of relative, 26 deaths of friends, neighbors or acquaintances, 58 major personal problems, and 36 visits to health care workers for bodily complaints. All of these events have counterparts in major event studies; thus, we feel that there was more than enough environmental variation reported in the daily reports to address prediction of outcomes from event measures.

Qualities of Event Report

The distribution of dimensional ratings was similar to those observed in our pilot studies (Stone & Neale, in press). Taken by themselves it is difficult to determine whether or not the ratings follow our expectations since the form of the distribution is determined by averaging the ratings over events with different content. Average ratings broken down by event type are more easily interpretable. In the work area, for example, events which we expected to be positive such as "praised for a job well done" and "promotion, raise" received desirable ratings; conversely, events that we expected

to be negative such as "criticized for inadequate work, etc. "employees not working well" received undesirable ratings. Likewise, on the meaningfulness dimension, events such as raises or quitting received extreme ratings whereas "socializing with staff," although desirable, received low meaningfulness ratings. Ratings with the control dimension were also interpretable. For example, the item "firing or disciplining by the target" received high control ratings whereas "employees not working well" received much lower control ratings. Finally, we did not have strong expectations about the change-stability dimension. The most changing event ("very") was "fired, quit, or resigned" while the most stabilizing ("slightly") of the work items was "praised for a job well done." These ratings make sense, but ex post facto analyses very often do.

In general, the specific dimensional ratings appear to be reasonable. There is a wide range of ratings among items and, with the exception of the change-stability dimension, ratings were almost always made for each event. Consistent with our pilot data, the "not applicable" option was chosen quite often with the change-stability scale; events were rated on this scale only 71 percent of the time. Sometimes changingness or stability just does not seem to be a salient quality of experiencing an event. Another interesting comparison is with Lazarus's work on daily hassles and uplifts. Overlooking an important difference between this work and our own (in Lazarus' work events are reported retrospectively for a month whereas ours are reported for a day), Lazarus finds that ratings of intensity and uplifts/irritants are redundant and simply excludes one of them in his analyses. Our data do not justify such a decision. Although highly correlated with desirability (64 percent common variance), meaningfulness shared only 25 percent of its variance with undesirable events. This difference may be due to either the monthly versus daily recording or perhaps due to the extremely detailed level of Lazarus's hassles and uplifts.

Another aspect of the dimensional analysis was an examination of each dimension's variability according to the event being rated. Because life events are often assessed using the mean ratings for all subjects, the variability of the ratings tells about individual and situational differences in how individuals appraise events. This data demonstrate that there are major differences in how particular events are rated. Some examples from the desirable-undesirable scale illustrate this nicely. Most of the item standard deviations were between 1.5 and 2.5 indicating that (given a normal distribution of responding) 65 percent of the ratings fell within about two adjectives to either side of the mean for the item. An event with more than average variability was "relatives sick or death of relative" and it is easy to imagine why this is so. Relatives could be sick to varying degrees from life threatening illness to more minor illness such as the flu. Loans was also a highly variable item; again, depending on the circumstances a loan could be desirable or undesirable. At the other extreme, "praise from spouse" was a very stable event so far as desirability ratings are concerned having a standard deviation of 1.2; likewise, "sexual interactions" also were quite stable.

As mentioned earlier, this analysis collapsed across individuals and events, confounding the two sources of variance. Future analyses we are planning will assess the degree of intra- and inter-individual variability to identify the characteristics of people with stable and variable appraisals of their daily events.

The last point concerning the rating dimensions is the interrelationships of dimensions ratings. Many life events inventories collect information on only one rating dimension or, as with the Life Experiences Survey (Sarason, Johnson & Siegal, 1978), combine two rating dimensions into one creating an artificial relationship between the two. Thus, an examination of the associations between event appraisals has not been possible. Since our cross-tabulation analysis demonstrated that the bipolar scales, desirable-undesirable and change-stability, were not monotonically related to other scales, we treated each pole of these dimensions as separate scales.

In the life events literature two of the more popular ways of assessing stress are with desirability (or pleasantness) and changingness (or readjustment) dimensions. We found that these dimensions were strongly related to one another, but differently for desirable and undesirable poles. In terms of frequencies, events which were more desirable tended to be rated as either more stable or changing, while events which were more undesirable tended to be rated only as more changing. However, the associations of desirability to changing-stabilizing and undesirability to changing-stabilizing were of similar magnitude, except that desirability and stabilizing were more strongly related. Meaningfulness tended to increase as a function of more extreme ratings on other dimensions. The control dimension was weakly related to all other dimensions; however, it was directly related to desirability and indirectly related to undesirable events.

Mood

Our usage of the Nowlis mood adjective checklist differed from the original Nowlis in two ways: first, instead of assessing momentary mood state, our modified version of the Nowlis assessed mood of the entire day. Second, we used the scale longitudinally, up to 90 consecutive administrations, instead of once or only a few times. For these reasons scale means and especially scale standard deviations are not comparable with the original Nowlis studies. Nonetheless, the range in scale means was approximately one, with a low of 1.28 and a high of 2.35. Standard deviations reflect both intra- and inter-individual variability and ranged from .53 to 1.01.

The 12 Nowlis scales were factored to reduce to mood information into a smaller, more manageable number of variables for the causal analysis. Approximately 66 percent of the variance was explained with three factors and the factors were readily interpretable. Negative Engagement (NE) consisted of the scales aggression, anxiety, fatigue, sadness, and skepticism. Positive Engagement (PE) consisted of surgency, elation, social affection, and nonchalance. Activation (A)

consisted of only two scales, concentration and vigor. One of the scales, egotism, did not load on any of the factors.

Although we could not test the effect of altering the Nowlis directions from reporting about the moment to reporting about the entire day, we did examine the effects of repeated administration. For subjects with roughly 90 days of reporting, we examined the average level and variability of both scales and factors across 30 day periods. A decrement in average level would be consistent with fatigue in reporting, whereas a decrement in standard deviation would indicate stereotyped reporting. Overall, there was no consistent pattern of changes in either means or standard deviations across the reporting thirds. Thus, we feel reports of daily mood do adequately reflect mood states and are relatively uninfluenced by reporting bias.

Symptom Data

Although the symptom checklist developed by Wyler, Masuda & Holmes (1968) was used in its entirety, we eliminated the item "overweight" from analyses because it appeared to be a long term condition rather than a transient symptom. The 50 subjects who we considered for the longitudinal analysis reported on the average a symptom every other day. However, five subjects reported an inordinately high number of symptoms, several per day for long periods, and when they were removed from the analysis the average symptom report dropped to .33 per day. Of the 1,338 symptoms reported by the group of 45 subjects, one quarter of them were colds, respiratory symptoms, and cold-related symptoms. Seventeen percent were aches and arthritis; 12 percent were headaches; 8 percent were symptoms that were described by subjects as due to drinking, physical trauma, or drugs; 7 percent were stomach aches; 6 percent were hay fever or asthma; 5 percent were diarrhea and constipation; another 5 percent were acne or cold sores; and, finally, 15 percent were remaining symptoms such as hemorrhoids, infected eye, bursitis, etc. Converting the raw symptom data to a small number of variables was, perhaps, the most difficult data reduction task in the entire project. Quite simply, there were no models available for guiding the reduction of the symptom data. The rules which we developed were based on careful consideration of each individual's daily symptoms and they were developed without any knowledge of the pattern of events and mood so that there would be no bias in terms of the event-mood-symptom relationship.

Considering the 45 subjects, there were 40 episodes reported with an average duration of approximately 12 days. Twentytwo episodes were either reported as colds or were viewed by us as colds given the symptoms that were reported. There were five episodes of hay fever, four of cold sores, two of flu, two of isolated sore throat, two of body ache, and one each of hemorrhoids, constipation, and stomach ache.

For the 45 subjects, there was a total of 869 days with either an isolated symptom or an episode present; this works out to an average of one symptomatic day in five.

As with the event and mood data, we were interested in symptom report over the 90 day study period. Days with symptoms dropped by 36 percent from the first to the second third and then increased to somewhat below the first third's level in the last thirty days. Episode frequency remained constant during the first 60 days, but dropped by about 45 percent during the last third. Average length of an episode started at 14 days yet dropped to 11 days in the final 60 days of reporting. Perhaps most striking was the decline in total symptomatic days: there were 340 days in the first 30 days, 238 in the second 30 days, and 198 in the final 30 days.

In light of the relatively constant report of both events and mood, it is difficult to understand the declining frequency of symptomatic days over time. If there was a global reporting bias, with a trend toward less reporting, we would expect that events and mood would show a change over time, but they did not change to any significant degree.

Summarization of Event Information

Our method of characterizing daily event information is clearly of tantamount importance as it either distills the essence of or fails to emphasize what is of consequence to later health. We made many decisions in our attempts to capture daily experience in the report, but there are two that are extremely important. First, we focused on the psychological impact of daily experiences as assessed by the four event qualities and put aside information pertaining to specific event content. Our justification for this decision rests with the body of literature suggesting that event appraisal is the key to understanding the environment's effect on mood and health. If there is a relationship between, say, work events and health, and subjects's appraisal of work events are not different from other types of events, then our results will be weak at best.

The other major decision concerns the event selection procedure. Events were included in the summary variables only if they were rated with at least the "moderately" adjective. Again, the rationale for this procedure rests with our adherence to the appraisal literature: events which do not elicit much of a psychological reaction should not have an effect on mood or health. If other processes are actually operating, and a plausible one is that an accumulation of very minor events has an impact equal to a more major event, then the results of this study will be weak.

Putting aside the qualifications of the procedure, we feel that our characterization of daily events is a useful procedure because it yields a readily interpretable metric. Unlike the LCU score, we know how many events of a particular type occurred on a given day. In practice, some of the classifications which simultaneously used all of the rating dimension did not prove to be very useful; the moderate correlation among dimensions yielded a few categories with extremely low frequencies, namely, the undesirable, stabilizing, in or out of control categories. This is not a problem in any way, simply a result

of how most people appraise events.

Once event classifications were computed, we concurrently validated them with same day mood ratings. Several studies have demonstrated relationships between events and concurrent mood so we expected that the event classifications which represented concepts similar to or equivalent to those studies should show significant relationships in the same direction. Results for desirable events yielded comparable associations with positive engagement and negative engagement mood factors; however, the association between undesirable events was somewhat smaller than those previously observed (Stone, in press). There are at least two possible explanations: one is that this analysis was considerably simpler because it averaged across individuals and days, whereas our previous work examined individual differences and averaged across them. The other possibility is that the cutoff procedure limited our prediction of negative mood. Nonetheless, these results demonstrated that our event summarization procedures were viable.

Aggregated Analyses

The analyses we used were a preliminary approach to an extremely complex data set. The approach is preliminary in several ways. Only a small portion of days were used to predict symptoms; namely, the number of target days was only about 300 whereas there was a potential for using most of the total number of days, about 4,000, as predictors. Again, one reason for using only part of the data was to avoid the sticky problem of autocorrelation in event reports. Using roughly ten percent of the data yielded very low frequencies in several event categories. Events with undesirable components were most seriously affected and results pertaining to such events are probably less reliable than we would like. With regard to our outcome measure, symptoms, we defined a variable which indicated the presence or absence of symptoms within the five day period following a target day. It is possible that such a definition could obscure certain types of event symptom relationships; for example, a six day incubation period between event and symptom onset would be missed by this analysis. Another relationship which could be overlooked is one where events produce symptoms only on the day following their occurrence. Since we average over five days, the true relationships would be diluted. Another reason for the preliminary approach was one of expediency. Analyses of each individual's set of daily reports would yield 50 sets of relative risks or means analogous to those we presented for the entire data set. Certainly these data are of interest, but are vastly more time consuming and difficult than those presented here. Although these analyses are currently underway, we felt preliminary analysis for ONR was in order.

With the test sample data, we found that desirable and stabilizing events reduced the likelihood of symptom report in the five days following the event. The degree of reduction in symptom rate depended upon the frequency of the event; generally, greater numbers of desirable, stabilizing, in control events were related to decreased

symptom reports. We feel that this is a reliable finding because the results in both relative risk and parametric analyses formed a consistent pattern across different types of event combinations and across different definitions of event occurrence, i.e, increasing the number of events required to define an occurrence.

In marked contrast to the test sample, the results of the replication yielded very few significant relative risks or significant differences with the parametric analysis. We could very well attribute the small number of significant statistics in the replication to chance and, indeed, perhaps that is the most parsimonious and accurate interpretation. Nonetheless, we pursued the differences between the test and replication samples because the two significant results found with the replication sample were in the opposite direction to those found with the test sample. The frequency of event occurrence and the correlations among event occurrences were compared in the two samples and differences were found. We explored the possibility that the joint occurrence patterns of different events (i.e., DMCo, DMNCo, etc.) which had previously been analyzed separately, were causing the disparate findings in the test and replication samples. When days were defined by both desirable and undesirable events, symptom rates decreased following days with many desirable events and no undesirable events in the test sample and symptom rates increased following days with many desirable and undesirable events in the replication sample. It should be noted, though, that the magnitude of the effect in the test sample was much larger than the effect observed in the replication sample. The protective effect in the test sample was a symptom reduction of one-fifth, which translates to a relative risk of .2, whereas the detrimental effect in the replication sample was a symptom increase of about two-fold, a relative risk of 1.78.

At the present time we are pursuing other possible differences between the test and replication samples. They may, for example, differ in personality factors, availibility of social supports or symptom reporting styles (hypochondriasis, sick-role tendency).

Of greater importance, however, is a shift to an idiographic data analytic strategy. From an inspection of the data already collected it is apparent that some subjects are markedly affected, in both mood and health, by the events they encounter. Others, however, seem to be relatively nonreative to their environments. Similar patterns were observed in Hinkle's (1974) classic studies of telephone company employees and immigrants to this country. Therefore, we are planning to conduct relative risk analyses on a single subject basis. Such analyses will tell us which qualities of events serve to either increase or decrease the risk for illness, and comparisons of reactive vs. nonreactive subjects may provide futher clues to psychological processes involved in mediating the stress-illness relationship.

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7923 Jones Branch Drive, Suite 500
McLean, Virginia 22102

Dr. Stuart W. Cook
Institute of Behavioral Sciences
University of Colorado
...er, Colorado 80309

Mr. Gerald M. Croan
Westinghouse National Issues Center
Suite 1111
2341 Jefferson Davis Highway
Arlington, Virginia 22202

Dr. Larry Cummings
Center for the Study of Organizational Performance
Graduate School of Business
University of Wisconsin - Madison
1155 Observatory Drive
Madison, Wisconsin 53706

Dr. John P. French, Jr.
Institute for Social Research
University of Michigan
P.O. Box 1248
Ann Arbor, Michigan 48106

Dr. Paul S. Goodman
Graduate School of Industrial Administration
Carnegie-Mellon University
Pittsburgh, Pennsylvania 15213

Dr. J. Richard Hackman
School of Organization & Management
Yale University
56 Hillhouse Avenue
New Haven, Connecticut 06520

Dr. Asa G. Hilliard, Jr.
Urban Institute for Human Services, Inc.
P.O. Box 15068
San Francisco, California 94115

Dr. Charles L. Hulin
Department of Psychology
University of Illinois
Champaign, Illinois 61820

Dr. Edna J. Hunter
United States International University
School of Human Behavior
P.O. Box 26110
San Diego, California 92126

Dr. Rudi Klauss
Syracuse University
Public Administration Department
Maxwell School
Syracuse, New York 13210

Dr. Judi Komaki
Georgia Institute of Technology
Engineering Experiment Station
Atlanta, Georgia 30332

Dr. Edward E. Lawler
Battelle Human Affairs Research Centers
P.O. Box 5395
4000 NE 41st Street
Seattle, Washington 98105

Dr. Edwin A. Locke
University of Maryland
College of Business & Management &
Department of Psychology
College Park, Maryland 20742

Dr. Ben Morgan
Performance Assessment Laboratory
Old Dominion University
Norfolk, Virginia 23508

Dr. Richard T. Mowday
Graduate School of Management & Business
University of Oregon
Eugene, Oregon 97403

Dr. Joseph Olmstead
Human Resources Research Organization
300 North Washington Street
Alexandria, Virginia 22314

Dr. Thomas M. Ostrom
Department of Psychology
116 East Stadium
Ohio State University
404C West 17th Avenue
Columbus, Ohio 43210

Dr. George E. Rowland
Temple University, Merit Center
Ritter Annex, 9th Floor
College of Education
Philadelphia, Pennsylvania 19122

Dr. Benjamin Schneider
Michigan State University
East Lansing, Michigan 48824

Dr. Saul B. Sells
Institute of Behavioral Research
Texas Christian University
Drawer C
Fort Worth, Texas 76129

Dr. H. Wallace Sinaiko
Program Director, Manpower Research
Advisory Services
Smithsonian Institution
801 North Pitt Street, Suite 120
Alexandria, Virginia 22314

Dr. Richard Steers
Graduate School of Management & Busin
University of Oregon
Eugene, Oregon 97403


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